# Red Hat Network Satellite 5.0 Installation Guide

Red Hat Network Satellite
Edition 1

Landmann

# Red Hat Network Satellite 5.0 Installation Guide

---

## Red Hat Network Satellite
## Edition 1

Landmann
rlandmann@redhat.com

**Legal Notice**

Copyright © 2008 Red Hat, Inc.

This document is licensed by Red Hat under the Creative Commons Attribution-ShareAlike 3.0 Unported License. If you distribute this document, or a modified version of it, you must provide attribution to Red Hat, Inc. and provide a link to the original. If the document is modified, all Red Hat trademarks must be removed.

Red Hat, as the licensor of this document, waives the right to enforce, and agrees not to assert, Section 4d of CC-BY-SA to the fullest extent permitted by applicable law.

Red Hat, Red Hat Enterprise Linux, the Shadowman logo, JBoss, MetaMatrix, Fedora, the Infinity Logo, and RHCE are trademarks of Red Hat, Inc., registered in the United States and other countries.

Linux ® is the registered trademark of Linus Torvalds in the United States and other countries.

Java ® is a registered trademark of Oracle and/or its affiliates.

XFS ® is a trademark of Silicon Graphics International Corp. or its subsidiaries in the United States and/or other countries.

MySQL ® is a registered trademark of MySQL AB in the United States, the European Union and other countries.

Node.js ® is an official trademark of Joyent. Red Hat Software Collections is not formally related to or endorsed by the official Joyent Node.js open source or commercial project.

The OpenStack ® Word Mark and OpenStack Logo are either registered trademarks/service marks or trademarks/service marks of the OpenStack Foundation, in the United States and other countries and are used with the OpenStack Foundation's permission. We are not affiliated with, endorsed or sponsored by the OpenStack Foundation, or the OpenStack community.

All other trademarks are the property of their respective owners.

**Abstract**

RHN Satellite Server provides a solution to organizations requiring absolute control over and privacy of the maintenance and package deployment of their servers. It allows Red Hat Network customers the greatest flexibility and power in keeping servers secure and updated.

# Table of Contents

**Chapter 1. Introduction** . . . . . **4**
1.1. Red Hat Network 4
1.2. RHN Satellite Server 4
1.3. Terms to Understand 5
1.4. How it Works 5
1.5. Summary of Steps 7
1.6. Upgrades 8

**Chapter 2. Requirements** . . . . . **9**
2.1. Software Requirements 9
2.2. Hardware Requirements 10
2.3. Database Requirements 11
2.4. Additional Requirements 12

**Chapter 3. Example Topologies** . . . . . **16**
3.1. Single Satellite Topology 16
3.2. Multiple Satellite Horizontally Tiered Topology 16
3.3. Satellite-Proxy Vertically Tiered Topology 17

**Chapter 4. Installation** . . . . . **18**
4.1. Base Install 18
4.2. RHN Satellite Server Installation Program 18
4.2.1. Options to the Satellite Installation Program 25
4.3. Automated RHN Satellite Server Installation 26
4.4. Sendmail Configuration 26
4.5. MySQL Installation 27

**Chapter 5. Entitlements** . . . . . **28**
5.1. Receiving the Certificate 28
5.2. Uploading the RHN Entitlement Certificate 29
5.3. Managing the RHN Certificate with RHN Satellite Activate 29
5.3.1. Command Line Entitlement Options 29
5.3.2. Activating the Satellite 30
5.4. Satellite Entitlement Certificate Expiration 30

**Chapter 6. Importing and Synchronizing** . . . . . **31**
6.1. Exporting with RHN Satellite Exporter 31
6.1.1. rhn-satellite-exporter 31
6.1.2. Exporting 32
6.1.2.1. Running the Export 32
6.2. Importing with RHN Satellite Synchronization Tool 33
6.2.1. satellite-sync 33
6.2.2. Preparing for Import from Local Media 35
6.2.2.1. Preparing Channel Content ISOs 35
6.2.2.2. Preparing RHN Satellite Exporter Data 36
6.2.3. Running the Import 36
6.3. Synchronizing 37
6.3.1. Synchronizing Errata and Packages Directly via RHN 38
6.3.2. Synchronizing Errata and Packages via Local Media 38

**Chapter 7. Troubleshooting** . . . . . **39**
7.1. Log Files 39
7.2. General Problems 39

7.3. Host Not Found/Could Not Determine FQDN 41
7.4. Connection Errors 41
7.5. Updated Software Components 42
7.6. Satellite Debugging by Red Hat 43

**Chapter 8. Maintenance** ..... **44**
8.1. Managing the Satellite Service 44
8.2. Updating the Satellite 44
8.3. Backing Up the Satellite 45
8.4. Using RHN DB Control 45
8.4.1. DB Control Options 46
8.4.2. Backing up the Database 46
8.4.3. Verifying the Backup 47
8.4.4. Restoring the Database 47
8.5. Cloning the Satellite with Embedded DB 47
8.6. Establishing Redundant Satellites with Stand-Alone DB 48
8.7. Conducting Satellite-Specific Tasks 49
8.7.1. Using the Tools menu 49
8.7.1.1. Maintaining the RHN Task Engine 50
8.7.1.2. Accessing the String Manager 50
8.7.2. Deleting Users 50
8.8. Automating Synchronization 51
8.9. Implementing PAM Authentication 52
8.10. Enabling Push to Clients 53

**Sample RHN Satellite Server Configuration File** ..... **54**

**Index** ..... **55**
Symbols 55
A 55
B 55
C 55
D 55
E 56
F 56
G 56
H 56
I 57
L 57
M 57
N 57
O 58
P 58
R 58
S 59
T 60
U 60

# Chapter 1. Introduction

RHN Satellite Server provides a solution to organizations requiring absolute control over and privacy of the maintenance and package deployment of their servers. It allows Red Hat Network customers the greatest flexibility and power in keeping servers secure and updated.

Two types of RHN Satellite Server are available: One with a stand-alone database on a separate machine and one with an embedded database installed on the same machine as the Satellite. This guide describes the installation of both types of Satellite.

Although the two types of RHN Satellite Server are functionally similar, some differences do exist. These variations are primarily isolated to hardware requirements, installation steps, and maintenance activities. They may also appear during troubleshooting. This guide identifies distinctions between the Satellite types by marking the differing instructions as either *Stand-Alone Database* or *Embedded Database*.

## 1.1. Red Hat Network

Red Hat Network (RHN) is the environment for system-level support and management of Red Hat systems and networks of systems. Red Hat Network brings together the tools, services, and information repositories needed to maximize the reliability, security, and performance of their systems. To use RHN, system administrators register the software and hardware profiles, known as System Profiles, of their client systems with Red Hat Network. When a client system requests package updates, only the applicable packages for the client are returned (based upon the software profile stored on the RHN Servers).

Advantages of using Red Hat Network include:

- Scalability — with Red Hat Network, a single system administrator can set up and maintain hundreds or thousands of Red Hat systems more easily, accurately, and quickly than they could maintain a single system without Red Hat Network.
- Standard Protocols — standard protocols are used to maintain security and increase capability. For example, XML-RPC gives Red Hat Network the ability to do much more than merely download files.
- Security — all communication between registered systems and Red Hat Network takes place over secure Internet connections.
- View Errata Alerts — easily view Errata Alerts for all your client systems through one website.
- Scheduled Actions — use the website to schedule actions, including Errata Updates, package installs, and software profile updates.
- Simplification — maintaining Red Hat systems becomes a simple, automated process.

## 1.2. RHN Satellite Server

RHN Satellite Server allows organizations to utilize the benefits of Red Hat Network without having to provide public Internet access to their servers or other client systems. System Profiles are stored locally on the customer's RHN Satellite Server. The Red Hat Network website is served from a local Web server and is not accessible from the Internet. All package management tasks, including Errata Updates, are performed through the local area network.

Advantages of using RHN Satellite Server include:

- Security — an end-to-end secure connection is maintained from the client systems to the RHN Satellite Server without connecting to the public Internet.
- Efficiency — packages are delivered significantly faster over a local area network.

- Control — clients' System Profiles are stored on the local RHN Satellite Server, not on the central Red Hat Network Servers.
- Customized updates — create a truly automated package delivery system for custom software packages required by client systems, as well as Red Hat packages. Custom *channels* allow fine-grained control of the delivery of custom packages.
- Access control — system administrators can be restricted to access only those systems within their maintenance responsibilities.
- Bandwidth management — the bandwidth used for transactions between the clients and the RHN Satellite Server is controlled by the organization on the local area network; RHN Satellite Server clients do not have to compete with other clients accessing the central Red Hat Network file servers.
- Scalability — RHN Satellite Server may oversee an entire organization's servers in combination with RHN Proxy Server.

## 1.3. Terms to Understand

Before understanding RHN Satellite Server, it is important to become familiar with the following Red Hat Network terms:

- *Channel* — A channel is a list of software packages. There are two types of channels: base channels and child channels. A *base channel* consists of a list of packages based on a specific architecture and Red Hat release. A *child channel* is a channel associated with a base channel that contains extra packages.
- *Organization Administrator* — An Organization Administrator is a user role with the highest level of control over an organization's Red Hat Network account. Members of this role can add other users, systems, and system groups to the organization as well as remove them. A Red Hat Network organization must have at least one Organization Administrator.
- *certificate authority* — A Channel Administrator is a user role with full access to channel management capabilities. Users with this role are capable of creating channels, assigning packages to channels, cloning channels, and deleting channels. This role can be assigned by an Organization Administrator through the **`Users`** tab of the RHN website.
- *Red Hat Update Agent* — The **Red Hat Update Agent** is the Red Hat Network client application that allows users to retrieve and install new or updated packages for the client system on which the application is run. For Red Hat Enterprise Linux 5 users, use the **`yum`** command; for Red Hat Enterprise Linux 4 and lower, use the **`up2date`** command.
- *Traceback* — A traceback is a detailed description of "what went wrong" that is useful for troubleshooting the RHN Satellite Server. Tracebacks are automatically generated when a critical error occurs and are mailed to the individual(s) designated in the RHN Satellite Server's configuration file.

For more detailed explanations of these terms and others, refer to the *Red Hat Network Reference Guide*.

## 1.4. How it Works

RHN Satellite Server consists of the following components:

- Database — for the Stand-Alone Database, this may be the organization's existing database or, preferably, a separate machine. RHN Satellite Server supports Oracle 9i R2. For the Embedded Database, the database comes bundled with RHN Satellite Server and is installed on the same machine as the Satellite during the installation process.

- RHN Satellite Server — core "business logic" and entry point for **Red Hat Update Agent** running on client systems. The RHN Satellite Server also includes an Apache HTTP Server (serving XML-RPC requests).
- RHN Satellite Server Web interface — advanced system, system group, user, and channel management interface.
- RPM Repository — package repository for Red Hat RPM packages and custom RPM packages identified by the organization.
- Management Tools:
  - Database and file system synchronization tools
  - RPM importing tools
  - Channel maintenance tools (Web-based)
  - Errata management tools (Web-based)
  - User management tools (Web-based)
  - Client system and system grouping tools (Web-based)
  - **Red Hat Update Agent** on the client systems

The **Red Hat Update Agent** on the client systems must be reconfigured to retrieve updates from the organization's internal RHN Satellite Server instead of the central Red Hat Network Servers. After this one-time reconfiguration, client systems may retrieve updates locally using the **Red Hat Update Agent**, or system administrators may schedule actions through the RHN Satellite Server website.

**Important**

Red Hat strongly recommends that clients connected to RHN Satellite Server be running the latest update of Red Hat Enterprise Linux to ensure proper connectivity.

When a client requests updates, the organization's internal RHN Satellite Server queries its database, authenticates the client system, identifies the updated packages available for the client system, and sends the requested RPMs back to the client system. Depending upon the client's preferences, the package may also be installed. If the packages are installed, the client system sends an updated package profile to the database on the RHN Satellite Server; those packages are removed from the list of outdated packages for the client.

The organization can configure the website for the RHN Satellite Server to be accessible from the local area network only or from both the local area network and the Internet. The Satellite's version of the RHN website allows full control over client systems, system groups, and users.

The RHN Satellite Server management tools are used to synchronize the RHN Satellite Server database and package repository with Red Hat Network. The RHN Satellite Server import tool allows the system administrator to include custom RPM packages in the package repository.

RHN Satellite Server can be used in conjunction with RHN Proxy Server to deliver a distributed, self-contained Red Hat Network deployment for the organization. For example, an organization can maintain one RHN Satellite Server in a secure location. Red Hat systems with local network access to the RHN Satellite Server can connect to it. Other remote offices can maintain RHN Proxy Server installations that connect to the RHN Satellite Server. The different locations inside the organization must be networked, but this can be a private network; an Internet connection is not required for any of the systems. Refer to the *RHN Proxy Server Installation Guide* for more information.

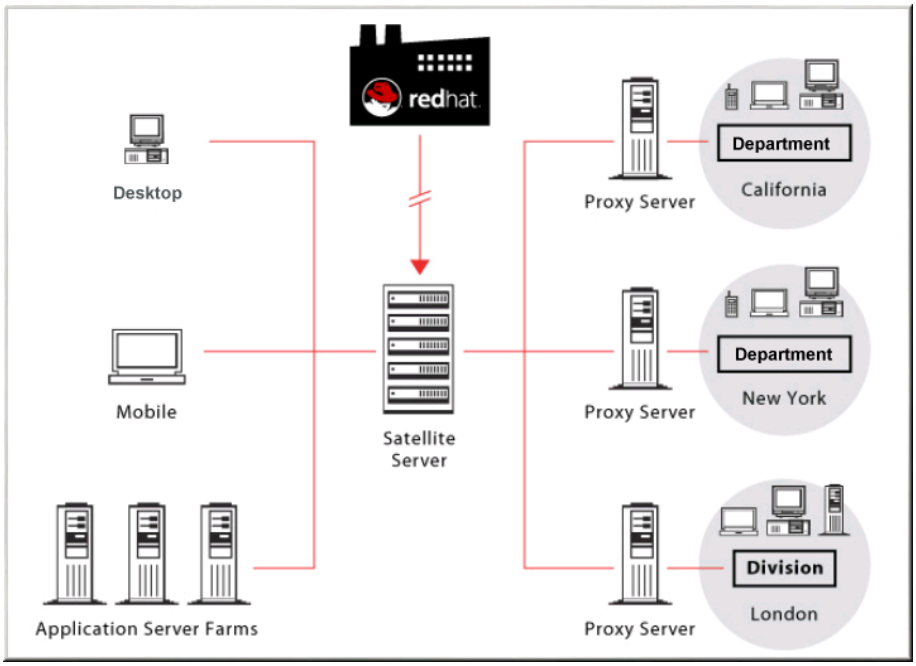



**Figure 1.1. Using RHN Satellite Server and RHN Proxy Server Together**

## 1.5. Summary of Steps

Implementing a fully functional RHN Satellite Server requires more than installing software and a database. Client systems must be configured to use the Satellite. Custom packages and channels should be created for optimal use. Since these tasks extend beyond the basic installation, they are covered in detail in other guides, as well as this *RHN Satellite Server Installation Guide*. For a full list of the necessary technical documents, refer to Chapter 2, *Requirements*.

For this reason, this section seeks to provide a definitive list of all required and recommended steps, from evaluation through custom package deployment. They should take place in roughly this order:

1. After an evaluation, you contact your Red Hat sales representative to purchase RHN Satellite Server.
2. Your Red Hat contact sends you an RHN Entitlement Certificate via email.
3. Your Red Hat contact creates a Satellite-entitled account on the RHN website and sends you the login information.
4. Log into the RHN website (rhn.redhat.com) and download the distribution ISOs for Red Hat Enterprise Linux AS 3 or 4 and RHN Satellite Server 5.0.0. These can be found within the **Downloads** tab of the respective **Channel Details** pages. Refer to the *RHN Reference Guide* for instructions.
5. While still logged into the RHN website, download the Channel Content ISOs to be served by your Satellite, also available through the **Downloads** tab of your Satellite's **Channel Details** page. These Channel Content ISOs differ from the distribution ISOs previously mentioned in that they contain metadata necessary for parsing and serving packages by Satellite.
6. If installing a Stand-Alone Database, prepare your database instance using the formula provided in Chapter 2, *Requirements*.
7. Install Red Hat Enterprise Linux AS and then RHN Satellite Server 5.0.0 on the Satellite machine.
8. Create the first user account on the Satellite by opening the Satellite's hostname in a Web

browser and clicking **`Create Account`**. This will be the Satellite Administrator's (also referred to as the Organization Administrator) account.

9. Use the **RHN Satellite Synchronization Tool** to import the channels and associated packages into the Satellite.
10. Register a representative machine for each distribution type, or channel (Red Hat Enterprise Linux AS 2.1, 3, 4), to the Satellite.
11. Copy (using SCP) the **`rhn_register`** and **`up2date`** configuration files from the **`/etc/sysconfig/rhn/`** directory of each machine individually to the **`/pub/`** directory on the Satellite. The **`rhn-org-trusted-ssl-cert-*.noarch.rpm`** will already be there.
12. Download and install from the Satellite the configuration files and **`rhn-org-trusted-ssl-cert-*.noarch.rpm`** on the remaining client systems of the same distribution type. Repeat this and the previous step until all distribution types are complete.
13. Through the Satellite's website, create an Activation Key for each distribution aligned to the appropriate base channel. At this point, system groups and child channels may also be predefined.
14. Run the Activation Key from the command line (**`rhnreg_ks`**) of each client system. Note that this step can be scripted to batch register and reconfigure all remaining client systems in a distribution.
15. Record all relevant usernames, passwords and other login information and store in multiple secure places.
16. Now that the Satellite is populated with standard Red Hat channels and packages and all clients are connected to it, you may begin creating and serving custom channels and packages. Once the custom RPMs are developed, you can import them into the Satellite using **RHN Push** and add custom channels in which to store them through the Satellite's website. Refer to the *RHN Channel Management Guide* for details.

## 1.6. Upgrades

The process for upgrading a Satellite from one version to another is not covered within this Satellite Guide, but can be found within the Red Hat Knowledgebase ( http://kbase.redhat.com/faq/) and can be found by performing a search for **`upgrade satellite`** or by following this link — http://kbase.redhat.com/faq/FAQ_49_8610.shtm.

# Chapter 2. Requirements

These requirements must be met before installation.

## 2.1. Software Requirements

To perform an installation, the following software components must be available:

- Base operating system — RHN Satellite Server is supported with Red Hat Enterprise Linux AS 3 Update 5 or later, or Red Hat Enterprise Linux AS 4 or later. The operating system can be installed from disc, local ISO image, kickstart, or any of the methods supported by Red Hat, but must provide the **@Base** package group and the **ntp** package.

**Note**

When Red Hat Enterprise Linux is mentioned, it refers to the x86, 32-bit version. All other variants of Red Hat Enterprise Linux are currently unsupported as a base operating system for the Satellite.

**Warning**

Security-enhanced Linux (SELinux) must be disabled or in permissive mode prior to installation of RHN Satellite Server. To do this during CD or ISO image installation, select **Permissive** when presented with options for SELinux support. To do this for kickstart installation, include the command **selinux --permissive** or wait for the install to complete, edit the **/etc/selinux/config** file to read **SELINUX=permissive** and reboot the system.
More in-depth coverage of SELinux is available at http://www.redhat.com/docs/. You may also refer to the Red Hat Knowledgebase article on SELinux and RHN Satellite Server at http://kbase.redhat.com/faq/.

- Satellite installation disc or ISO — this contains the **RHN Satellite Server Installation Program**. All packages required in order to suport the Program are installed automatically, and require no intervention from the user.

**Note**

Installing packages other than the packages contained in the **@Base** package group and the **ntp** package can lead to package conflicts.

- Channel content — All software packages and data exported for all entitled Red Hat channels. This content may be loaded directly on the Satellite after installation using the **RHN Satellite Synchronization Tool** or obtained from your Red Hat representative if synchronization is not possible, such as in a disconnected environment.

When installing Red Hat Enterprise Linux AS 3 or 4 from CD or ISO image, there is no need to select any package groups, only the base install is required. When installing either operating system via kickstart, select the @ Base package group.

## 2.2. Hardware Requirements

The following hardware configuration is required for the two types of RHN Satellite Server:

**Table 2.1. Stand-Alone Database and Embedded Database Satellite Hardware Requirements**

| Stand-Alone Database | Embedded Database |
|---|---|
| Required - Pentium IV processor, 2.4GHz, 512K cache or equivalent | Required - Pentium IV processor, 2.4GHz, 512K cache or equivalent |
| Recommended - Pentium IV processor, 2.4GHz dual processor, 512K cache or equivalent | Recommended - Pentium IV processor, 2.4GHz dual processor, 512K cache or equivalent |
| Required - 2 GB of memory | Required - 2 GB of memory |
| Recommended - 4 GB of memory | Strongly recommended - 4 GB of memory |
| 3 GB storage for base install of Red Hat Enterprise Linux AS | 3 GB storage for base install of Red Hat Enterprise Linux AS |
| 6 GB storage per channel, in the **/var/satellite/** directory by default but configurable at install | 6 GB storage per channel, in the **/var/satellite/** directory by default but configurable at install |
| Recommended - an external SAN for more reliable backups | Recommended - an external SAN for more reliable backups |
| | 12 GB storage for the database repository, in the **/rhnsat** partition (local storage only) |
| | Strongly recommended - a SCSI drive connected to a level 5 RAID |
| | Separate partition (or better, a separate set of physical disks) for storing backups. This can be any directory specifiable at backup time. |

The following hardware configuration is required for the Stand-Alone Database:

- Two processors
- 2 GB of memory

See Section 2.3, “Database Requirements” for instructions on estimating the tablespace of the database and setting its environment variables.

Keep in mind, the frequency with which client systems connect to the Satellite is directly related to load on the Apache Web server and the database. Reducing the default interval of four hours (or 240 minutes) as set in the **/etc/sysconfig/rhn/rhnsd** configuration file of the client systems significantly increases the load on those components.

Additional hardware requirements include:

- The Stand-Alone Database must not run on the same server as the RHN Satellite Server.
- The package repository may be any large storage device easily and securely accessed by the other components. The space requirements depend on the number of packages that will be stored. Default Red Hat channels contain approximately 3 GB of packages each, and that size grows with each synchronization; customers must also account for the space requirements of packages in their own private channels. Whatever storage solution the customer chooses, its mount point may be defined

during the installation process.

If you are installing RHN Satellite Server with Embedded Database, skip to Section 2.4, “Additional Requirements”.

## 2.3. Database Requirements

This section applies only to RHN Satellite Server with Stand-Alone Database as the requirements for the Embedded Database are included in the Satellite machine's hardware requirements. Red Hat supports RHN Satellite Server 5.0.0 installations in conjunction with Oracle 9i R2. The Stand-Alone Database must not run on the same server as the RHN Satellite Server.

A single 6 GB tablespace is recommended as more than sufficient for most installations. It is possible for many customers to function with a smaller tablespace. An experienced Oracle database administrator (DBA) will be necessary to assess sizing issues. The following formula should be used to determine the required size of your database:

- 192 KB per client system
- 64 MB per channel

For instance, an RHN Satellite Server containing 10 channels serving 10,000 systems would require 1.92 GB for its clients and 640 MB for its channels. If custom channels are to be established for testing and staging of packages, they must be included in this formula.

Keep in mind, the database storage needs may grow rapidly, depending upon the variance of the following factors:

- The number of public Red Hat packages imported (typical: 5000)
- The number of private packages to be managed (typical: 500)
- The number of systems to be managed (typical: 1000)
- The number of packages installed on the average system (typical: 500)

Although you should be generous in your database sizing estimates, you must consider that size affects the time to conduct backups and adds load to other system resources. If the database is shared, its hardware and spacing are entirely dependent on what else is using it.

Additionally, block sizes must be a minimum of 8 KB for RHN Satellite Server to install properly.

The Oracle database should have a user assigned to RHN Satellite Server with full DDL and DML access to that user's default tablespace. The user needs standard connection information for the database at the time of installation.

The precise access levels required by the Oracle user are as follows:

- ALTER SESSION
- CREATE SEQUENCE
- CREATE SYNONYM
- CREATE TABLE
- CREATE VIEW
- CREATE PROCEDURE
- CREATE TRIGGER
- CREATE TYPE

- CREATE SESSION

Additional database requirements include:

- Security Identifier (SID)
- Listener Port
- Username
- Uniform Extent Size
- Auto Segment Space Management
- UTF-8 character set

**Note**

Ensure that the NLS/charset setting is set to "UTF8"' when using an external database, not 'AL32UTF8' or other charsets. Using other charsets may lead to problems later.

The disk layout on the database machine is independent of the RHN Satellite Server and entirely up to the customer.

## 2.4. Additional Requirements

The following additional requirements must be met before the RHN Satellite Server installation:

- Full Access

  Client systems need full network access to the RHN Satellite Server solution's services and ports.
- Firewall Rules

  RHN strongly recommends firewalling the RHN Satellite Server solution from the Internet. However, various TCP ports must be opened on the Satellite, depending on your implementation of RHN Satellite Server:

**Table 2.2. Ports to open on the Satellite**

| Port | Direction | Reason |
|---|---|---|
| 80 | Outbound | Satellite uses this port to reach rhn.redhat.com, xmlrpc.rhn.redhat.com and satellite.rhn.redhat.com(unless running in a disconnected mode for Satellite) |
| 80 | Inbound | WebUI and client requests come in via either http or https |
| 443 | Inbound | WebUI and client requests come in via either http or https |
| 443 | Outbound | To reach rhn.redhat.com, xmlrpc.rhn.redhat.com and satellite.rhn.redhat.com(unless running in a disconnected mode for Satellite) |
| 4545 | Outbound | RHN Satellite Server Monitoring makes connections to **rhnmd** running on client systems, if Monitoring is enabled and probes are configured for registered systems. |
| 5222 | Inbound | If you plan to push actions to client systems |
| 5269 | Inbound | If you push actions to an RHN Proxy Server |

- Synchronized System Times

  There is great time sensitivity when connecting to a Web server running SSL (Secure Sockets Layer); it is imperative that the time settings on the clients and server be reasonably close together so the SSL certificate does not expire before or during use. For this reason, Red Hat requires the Satellite and all client systems to use Network Time Protocol (NTP). This also applies to the separate database machine in RHN Satellite Server with Stand-Alone Database, which must also be set to the same time zone as the Satellite.

- Fully Qualified Domain Name (FQDN)

  The system upon which the RHN Satellite Server will be installed must resolve its own FQDN properly. If this is not the case, cookies will not work properly on the website.

**Note**

It is important that the hostname of a Satellite contains no uppercase letters. A hostname that includes uppercase letters can cause **jabberd** to fail.

- Functioning Domain Name Service (DNS)

  For the RHN Satellite Server's domain name to be resolved by its clients, it and they must all be linked to a working DNS server in the customer environment.

- An Entitlement Certificate

  The customer will receive, via email from the sales representative, a signed Entitlement Certificate explaining the services provided by Red Hat through RHN Satellite Server. This certificate will be required during the installation process.

- A Red Hat Network Account

  Customers who connect to the central Red Hat Network Servers to receive incremental updates must have an external account with Red Hat Network. This account should be set up at the time of purchase with the sales representative.

**Warning**

Do not subscribe your RHN Satellite Server to any of the following child channels available on RHN Hosted:

- Red Hat Developer Suite
- Red Hat Application Server
- Red Hat Extras

Subscribing to these channels and updating your Satellite (such as by running **`up2date`**) may install newer, incompatible versions of critical software components, causing the Satellite to fail.

- Backups of Login Information

  It is imperative that customers keep track of all primary login information. For RHN Satellite Server, this includes usernames and passwords for the Organization Administrator account on rhn.redhat.com, the primary administrator account on the Satellite itself, SSL certificate generation, and database connection (which also requires a SID, or net service name). Red Hat strongly recommends this information be copied onto two separate floppy disks, printed out on paper, and stored in a fireproof safe.

In addition to these requirements, it is recommended that the RHN Satellite Server be configured in the following manner:

- The entire RHN Satellite Server solution should be protected by a firewall if the Satellite accesses or is accessed via the Internet. An Internet connection is not required for RHN Satellite Servers running in completely disconnected environments. This feature instead uses Channel Content ISOs that can be downloaded to a separate system to synchronize the Satellite with the central Red Hat Network Servers. All other RHN Satellite Servers should be synchronized directly over the Internet.
- All unnecessary ports should be firewalled off. Client systems connect to RHN Satellite Server over ports 80, 443, and 4545 (if Monitoring is enabled). In addition, if you plan to enable the pushing of actions from the Satellite to client systems, as described in Section 8.10, “Enabling Push to Clients”, you must allow inbound connections on port 5222. Finally, if the Satellite will also push to an RHN Proxy Server, you must also allow inbound connections on port 5269.
- No system components should be directly, publicly available. No user other than the system administrators should have shell access to these machines.
- All unnecessary services should be disabled using **`ntsysv`** or **`chkconfig`**.
- The **`httpd`** service should be enabled.
- If the Satellite serves Monitoring-entitled systems and you wish to acknowledge via email the alert notifications you receive, you must configure **`sendmail`** to properly handle incoming mail as described in Section 4.4, “Sendmail Configuration”.

Finally, you should have the following technical documents in hand for use in roughly this order:

1. *The RHN Satellite Server Installation Guide* — This guide, which you are now reading, provides the essential steps necessary to get an RHN Satellite Server up and running.
2. *The RHN Client Configuration Guide* — This guide explains how to configure the systems to be

served by an RHN Proxy Server or RHN Satellite Server. (This will also likely require referencing *The RHN Reference Guide*, which contains steps for registering and updating systems.)

3. *The RHN Channel Management Guide* — This guide identifies in great detail the recommended methods for building custom packages, creating custom channels, and managing private Errata.
4. *The RHN Reference Guide* — This guide describes how to create RHN accounts, register and update systems, and use the RHN website to its utmost potential. This guide will probably come in handy throughout the installation and configuration process.

# Chapter 3. Example Topologies

The RHN Satellite Server can be configured in multiple ways. Select one method depending on the following factors:

- The total number of client systems to be served by the RHN Satellite Server.
- The maximum number of clients expected to connect *concurrently* to the RHN Satellite Server.
- The number of custom packages and channels to be served by the RHN Satellite Server.
- The number of RHN Satellite Servers being used in the customer environment.
- The number of RHN Proxy Servers being used in the customer environment.

The rest of this chapter describes possible configurations and explains their benefits.

## 3.1. Single Satellite Topology

The simplest configuration is to use a single RHN Satellite Server to serve your entire network. This configuration is adequate to service a medium-size group of clients and network.

The disadvantage of using one RHN Satellite Server is that performance will be compromised as the number of clients requesting packages grows.

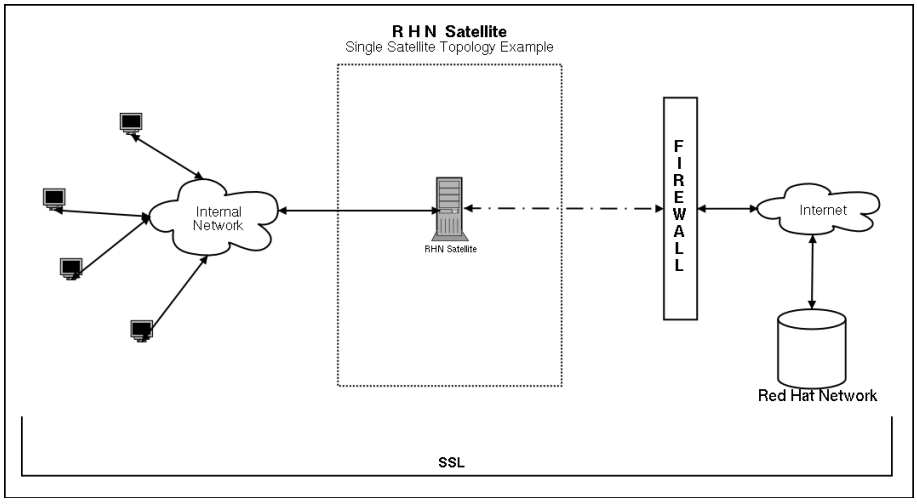



**Figure 3.1. Single Satellite Topology**

## 3.2. Multiple Satellite Horizontally Tiered Topology

For very large networks, a more distributed method may be needed, such as having multiple RHN Satellite Servers in a horizontally tiered configuration and balancing the load of client requests.

It is possible to synchronize content between RHN Satellites using the **`rhn-satellite-exporter`** and **`satellite-sync -m`** commands. This feature is discussed in detail in Section 6.1.1, “**`rhn-satellite-exporter`**”.

Additional maintenance is the biggest disadvantage of this horizontal structure.

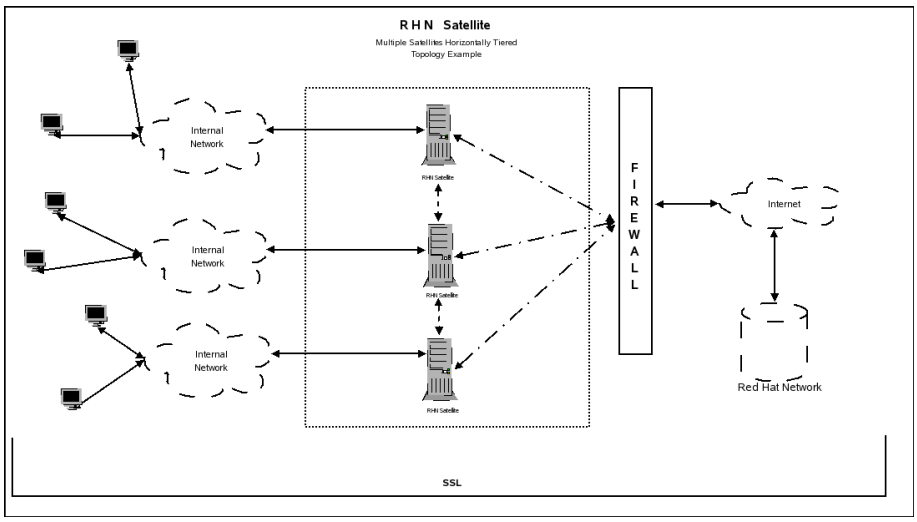



**Figure 3.2. Multiple Satellite Horizontally Tiered Topology**

## 3.3. Satellite-Proxy Vertically Tiered Topology

An alternative method to balance load is to install RHN Proxy Servers below a RHN Satellite Server. These Proxies connect to the Satellite for RPMs from Red Hat Network and custom packages created locally. In essence, the Proxies act as clients of the Satellite.

This vertically tiered configuration requires that channels and RPMs be created only on the RHN Satellite Server. In this manner, the Proxies inherit and then serve packages from a central location. For details, refer to the *RHN Channel Management Guide*.

Similarly, you should make the Proxies' SSL certificates clients of the Satellite while also setting them to serve the client systems. This process is described in the *RHN Client Configuration Guide*.

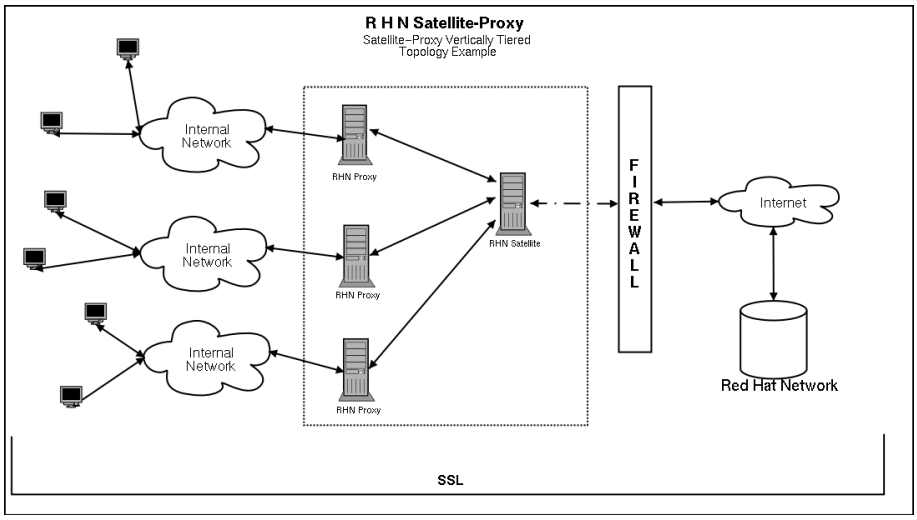



**Figure 3.3. Satellite-Proxy Vertically Tiered Topology**

# Chapter 4. Installation

This chapter describes the initial installation of the RHN Satellite Server. It presumes the prerequisites listed in Chapter 2, *Requirements* have been met. If you are instead upgrading to a newer version of RHN Satellite Server, contact your Red Hat representative for assistance.

## 4.1. Base Install

The RHN Satellite Server is designed to run on the Red Hat Enterprise Linux AS operating system. Therefore, the first phase is to install the base operating system, either from disc, ISO image, or kickstart. During and after operating system installation, make sure you:

- Allocate plenty of space to the partitions storing data. The default location for channel packages is **/var/satellite/**. For RHN Satellite Server with Embedded Database, remember the database RPMs go in the **/opt/** partition, while the database itself is built in **/rhnsat/**. Refer to Section 2.2, "Hardware Requirements" for precise specifications.
- Enable Network Time Protocol (NTP) on the Satellite and separate database, if it exists, and select the appropriate time zone. All client systems should already be running the **ntpd** daemon and be set to the correct time zone.
- Due to potential complications, it is strongly advised that the **/home/** partition is locally mounted.

## 4.2. RHN Satellite Server Installation Program

The following instructions describe how to run the **RHN Satellite Server Installation Program**:

**Important**

Due to potential complications, it is *strongly* advised that the **/home/** partition is locally mounted.

1. Log into the machine as root.
2. Insert the RHN Satellite Server CD containing the installation files or download the ISO image from the RHN website.
3. If you are installing from CD, Red Hat Enterprise Linux may automount the CD. If it does so, it will mount the CD to the **/media/cdrom/** directory.

   If Red Hat Enterprise Linux does not automount the CD, manually mount it to the **/media/cdrom/** directory with the following command:

   ```
   mount /dev/cdrom /media/cdrom
   ```

   If you are installing from an ISO, mount the file from within the directory containing it using the command:

   ```
   mount -o loop iso_filename /media/cdrom
   ```

   The remaining instructions assume it is mounted in **/media/cdrom/**.
4. Ensure that the RHN Entitlement Certificate has been copied onto the Satellite's file system. It can be named anything and located in any directory. The installation program will ask you for its location. Also, make sure your account has been granted the necessary entitlements to conduct the installation. For instance, a new Satellite will require both a Management or Provisioning

entitlement for Red Hat Enterprise Linux AS and an RHN Satellite Server entitlement.

**Warning**

Users should note that the **RHN Satellite Server Installation Program** updates the kernel, as well as all required packages.

5. From the **/media/cdrom/** directory, enter the following command to start the **RHN Satellite Server Installation Program**:

```
./install.pl
```

This script has several options to assist with your installation process. To view these options, enter the following command:

```
./install.pl --help
```

6. The script first runs through a pre-requisite check. These checks make certain that all prerequisites from Chapter 2, *Requirements* are met before proceeding with the installation.

```
* Starting the Red Hat Network Satellite installer.
* Performing pre-install checks.
* Pre-install checks complete.  Beginning installation.
```

7. At the prompt, enter the email address to which you would like notifications from the Satellite to be sent. It may be a good idea to choose a general email address rather than the address of an individual, as there can be a large volume of emails.

```
? Admin email address? sat-admin@example.com
```

8. The Satellite is then registered with your RHN Hosted account, and all required packages are installed and updated.

```
* RHN Registration
* Installing updates.
* Installing RHN packages.
```

9. Next, the RHN Satellite Server Installation Program downloads and installs the RHN GPG key, including setting up the **/root/.gnupg/** directory, if required.

```
* Setting up environment and users
** GPG: Initializing GPG and importing RHN key.
** GPG: Creating /root/.gnupg directory
```

10. The next step creates and populates the initial database, if you have opted for the RHN Satellite Server with Embedded Database. If you are installing RHN Satellite Server with Stand-Alone Database, the installer connects with the database. This step can take quite a while. If you would like to monitor the progress of the installation, use **tail** in a separate window to monitor the **/var/log/rhn/install_db.log** file.

```
* Setting up database.
** Database: Installing the embedded database (not the schema).
** Database: Shutting down the database first.
** Database: Installing the database:
** Database: This is a long process that is logged in:
** Database:   /var/log/rhn/install_db.log
*** Progress: ####
```

11. Once database installation is complete, or once the connection to the database is established, the Satellite is configured.

```
* Setting up environment and users.
```

12. In order to activate the Satellite, you must provide it with the location of your Satellite certificate.

```
* Activating Satellite.
Where is your satellite certificate file? /root/example.cert
```

13. The next step is to create a CA cert for the Satellite. To do so, you must answer a few questions.

    **CA cert**
    Enter a password for the certificate.

    **Organization**
    Enter the name of your organization

    **Email Address**
    Enter an email address to be associated with this certificate, such as the admin email entered in the steps above.

    **City**
    Enter the city where the Satellite resides.

    **Country**
    Enter the country where the Satellite resides. The country code must be exactly two letters, or the certificate generation fails.

14. Once the CA Cert certificate is generated, the **RHN Satellite Server Installation Program** performs final configuration and restarts the associated services.

```
* Final configuration.
* Restarting services.
Installation complete.
Visit https://your-satellite.example.com to create the satellite administrator
account.
```

15. Follow the on-screen instructions and visit the FQDN of your Satellite via a web browser. Create the satellite administrator account - also referred to as the Organization Administrator - and click the **`Create Login`** button to move to the next screen, the **`Your RHN`** screen.

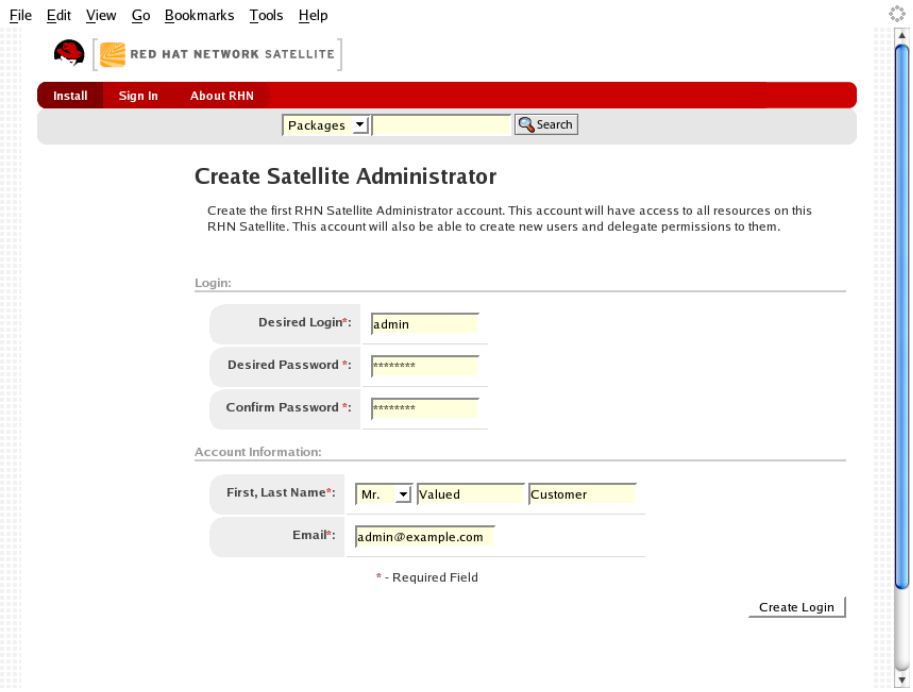



**Figure 4.1. Admin Account Creation**

16. A blue text box appears at the top of the screen indicating that you can now custom-configure the Satellite and its behavior. To do so, click the bold **`clicking here`** text at the end.

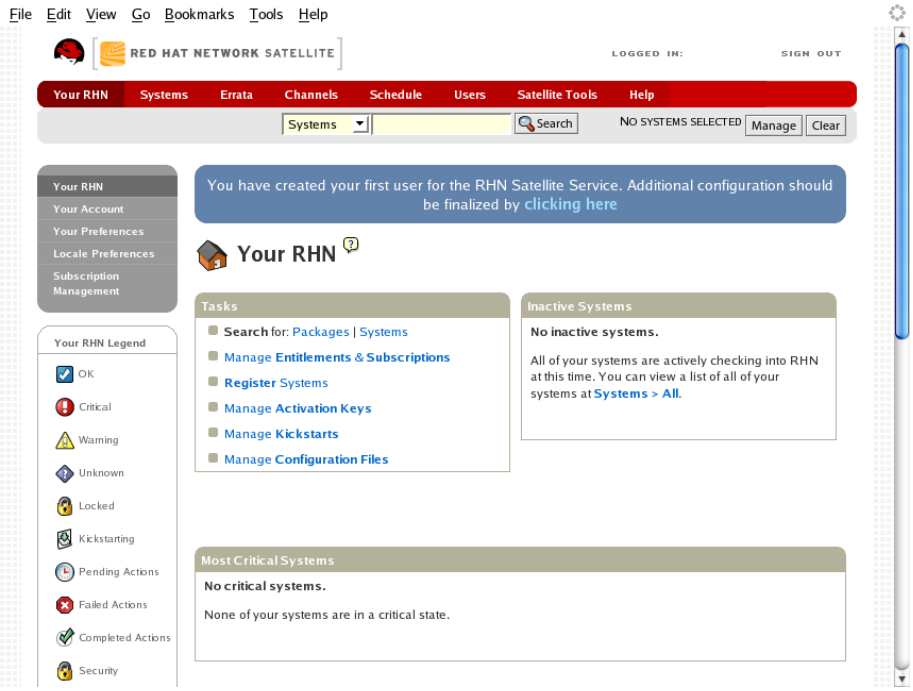



**Figure 4.2. Final Configuration Prompt**

17. The **`Satellite Configuration - General Configuration`** page allows you to alter the most basic Satellite settings, such as the admin email address and whether Monitoring is enabled.

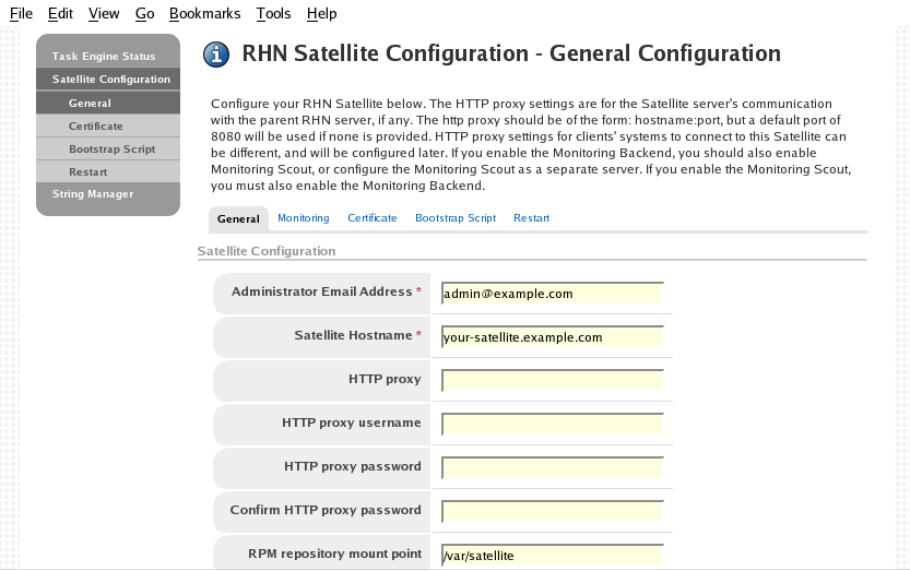

File Edit View Go Bookmarks Tools Help
Task Engine Status
Satellite Configuration
General
Certificate
Bootstrap Script
Restart
String Manager
RHN Satellite Configuration - General Configuration
Configure your RHN Satellite below. The HTTP proxy settings are for the Satellite server's communication with the parent RHN server, if any. The http proxy should be of the form: hostname:port, but a default port of 8080 will be used if none is provided. HTTP proxy settings for clients' systems to connect to this Satellite can be different, and will be configured later. If you enable the Monitoring Backend, you should also enable Monitoring Scout, or configure the Monitoring Scout as a separate server. If you enable the Monitoring Scout, you must also enable the Monitoring Backend.
General Monitoring Certificate Bootstrap Script Restart
Satellite Configuration
Administrator Email Address *
admin@example.com
Satellite Hostname *
your-satellite.example.com
HTTP proxy
HTTP proxy username
HTTP proxy password
Confirm HTTP proxy password
RPM repository mount point
/var/satellite

**Figure 4.3. General Configuration**

18. The **RHN Satellite Configuration - Monitoring** page allows you to configure the monitoring aspects of this Satellite. The local mail exchanger and local main domain are used to mail monitoring notification messages to administration. This is required only if you intend to receive alert notifications from probes. If you do, provide the mail server (exchanger) and domain to be used. Note that **sendmail** must be configured to handle email redirects of notifications. Refer to Section 4.4, "Sendmail Configuration" for instructions. When finished, click **Continue**. The **RHN Registration** page appears.

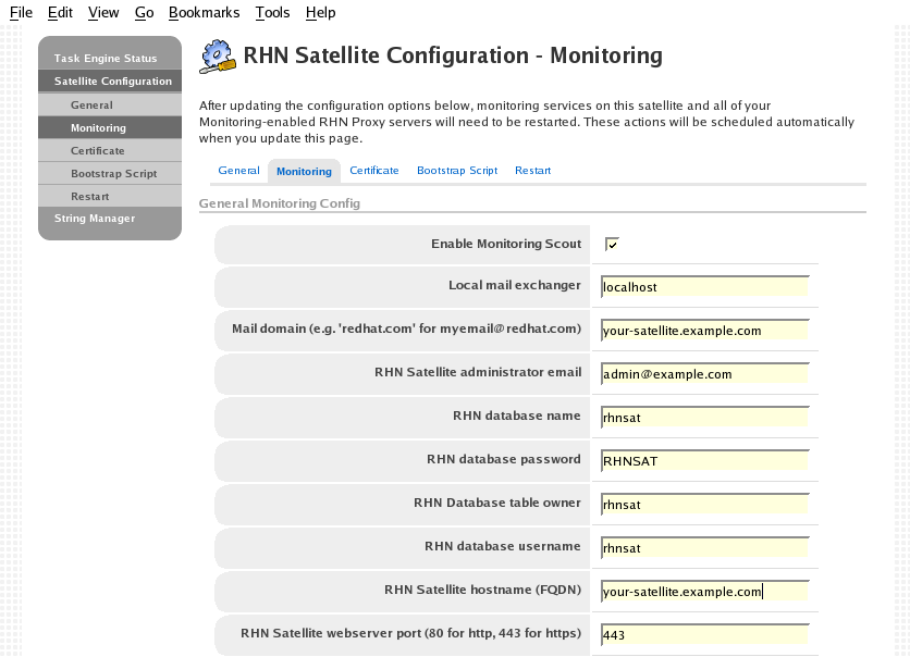



**Figure 4.4. Monitoring**

19. The **RHN Satellite Configuration - Certificate** page allows you to upload a new Satellite certificate. To identify the certificate's path, click **Browse**, navigate to the file, and select it. To input its contents, open your certificate in a text editor, copy all lines, and paste them directly into the large text field at the bottom. Red Hat recommends using the file locator as it is less error

prone. Click **Validate Certificate** to continue. If you receive errors related to DNS, ensure your Satellite is configured correctly. Refer to Section 7.3, “Host Not Found/Could Not Determine FQDN”.

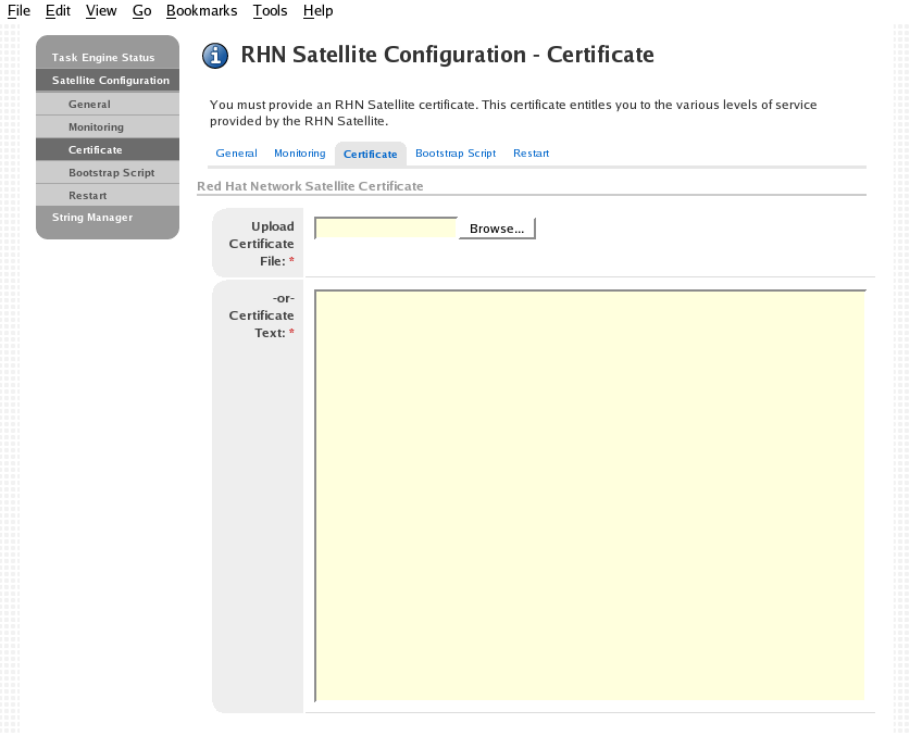

File Edit View Go Bookmarks Tools Help
Task Engine Status
Satellite Configuration
General
Monitoring
Certificate
Bootstrap Script
Restart
String Manager
RHN Satellite Configuration - Certificate
You must provide an RHN Satellite certificate. This certificate entitles you to the various levels of service provided by the RHN Satellite.
General Monitoring Certificate Bootstrap Script Restart
Red Hat Network Satellite Certificate
Upload Certificate File: *
Browse...
-or- Certificate Text: *

**Figure 4.5. Certificate**

20. The **RHN Satellite Configuration - Bootstrap** page allows you to generate a bootstrap script for redirecting client systems from the central RHN Servers to the Satellite. This script, to be placed in the **/var/www/html/pub/bootstrap/** directory of the Satellite, significantly reduces the effort involved in reconfiguring all systems, which by default obtain packages from the central RHN Servers. The required fields are pre-populated with values derived from previous installation steps. Ensure this information is accurate.

    Checkboxes offer options for including built-in security SSL and GNU Privacy Guard (GPG) features, both of which are advised. In addition, you may enable remote command acceptance and remote configuration management of the systems to be bootstrapped here. Both features are useful for completing client configuration. Finally, if you are using an HTTP proxy server, complete the related fields. When finished, click **Generate Bootstrap Script**. The **Installation Complete** page appears.

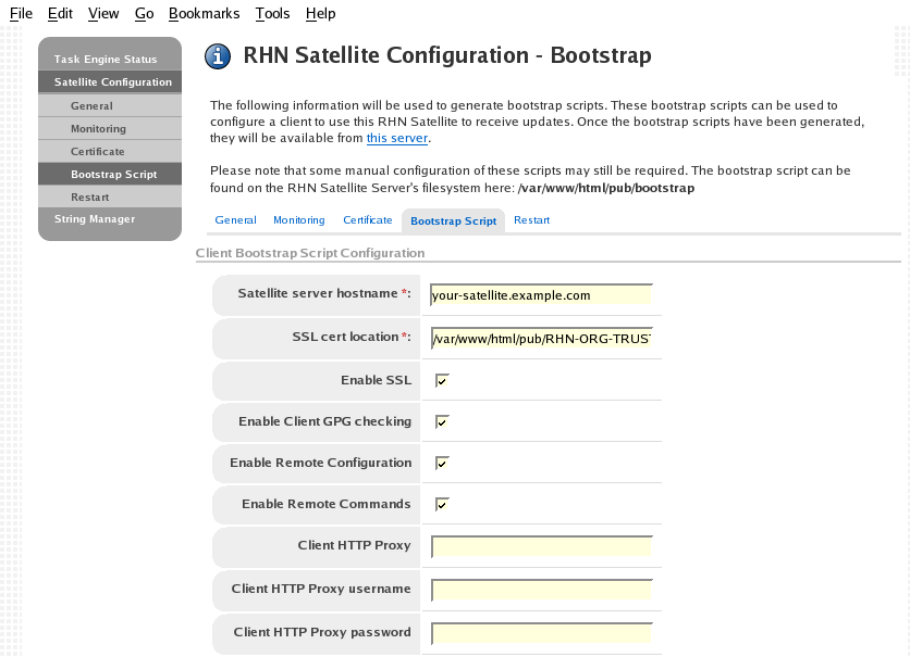

File Edit View Go Bookmarks Tools Help
Task Engine Status
Satellite Configuration
General
Monitoring
Certificate
Bootstrap Script
Restart
String Manager
RHN Satellite Configuration - Bootstrap
The following information will be used to generate bootstrap scripts. These bootstrap scripts can be used to configure a client to use this RHN Satellite to receive updates. Once the bootstrap scripts have been generated, they will be available from this server.
Please note that some manual configuration of these scripts may still be required. The bootstrap script can be found on the RHN Satellite Server's filesystem here: /var/www/html/pub/bootstrap
General Monitoring Certificate Bootstrap Script Restart
Client Bootstrap Script Configuration
Satellite server hostname *:
your-satellite.example.com
SSL cert location *:
/var/www/html/pub/RHN-ORG-TRUS
Enable SSL
Enable Client GPG checking
Enable Remote Configuration
Enable Remote Commands
Client HTTP Proxy
Client HTTP Proxy username
Client HTTP Proxy password

**Figure 4.6. Bootstrap**

21. The **`RHN Satellite Configuration - Restart`** page contains the final step in configuring the Satellite. Click the **`Restart`** button to restart the Satellite in order to incorporate all of the configuration options added on the previous screens. Note that it will take between four and five minutes for the restart to finish.

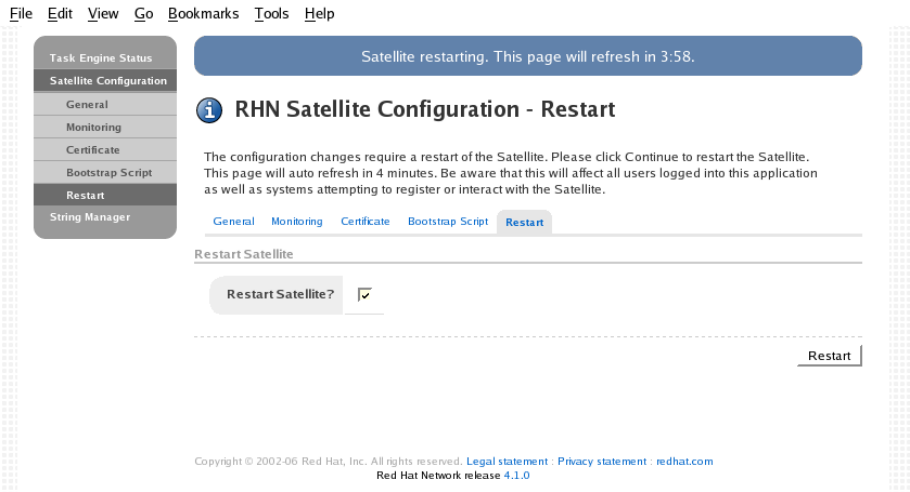

File Edit View Go Bookmarks Tools Help
Task Engine Status
Satellite Configuration
General
Monitoring
Certificate
Bootstrap Script
Restart
String Manager
Satellite restarting. This page will refresh in 3:58.
RHN Satellite Configuration - Restart
The configuration changes require a restart of the Satellite. Please click Continue to restart the Satellite. This page will auto refresh in 4 minutes. Be aware that this will affect all users logged into this application as well as systems attempting to register or interact with the Satellite.
General Monitoring Certificate Bootstrap Script Restart
Restart Satellite
Restart Satellite?
Restart
Copyright © 2002-06 Red Hat, Inc. All rights reserved. Legal statement : Privacy statement : redhat.com
Red Hat Network release 4.1.0

**Figure 4.7. Restart**

22. Once the Satellite has restarted, the countdown notice disappears. You are now free to begin using your Satellite.

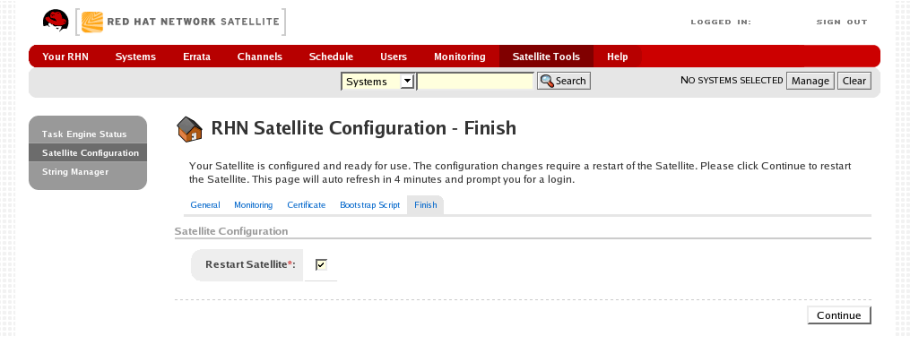



**Figure 4.8. Restart Complete**

## 4.2.1. Options to the Satellite Installation Program

The various options available for the Satellite Installation Program are included below for easy reference.

**Table 4.1. Installation Options**

| Option | Usage |
|---|---|
| **--help** | Print this help message. |
| **--answer-file=<*filename*>** | Indicates the location of an answer file to be use for answering questions asked during the installation process. |
| **--non-interactive** | For use only with **--answer-file**. If the **--answer-file** does not provide a required response, exit instead of prompting the user. |
| **--re-register** | Register the system with RHN, even if it is already registered. |
| **--disconnected** | Install the satellite in disconnected mode. |
| **--clear-db** | Clear any pre-existing database schema before installing. This will destroy any data in the Satellite database and re-create empty Satellite schema. |
| **--skip-system-version-test** | Do not test the Red Hat Enterprise Linux version before installing. |
| **--skip-selinux-test** | Do not check to make sure SELINUX is disabled. RHN Satellite is not currently supported on selinux-enabled systems. |
| **--skip-fqdn-test** | Do not verify that the system has a valid hostname. RHN Satellite requires that the hostname be properly set during installation. Using this option may result in a Satellite server that is not fully functional. |
| **--skip-db-install** | Do not install the embedded database. This option may be useful if you are reinstalling the satellite, and do not want to clear the database. |
| **--skip-db-diskspace-check** | Do not check to make sure there is enough free disk space to install the embedded database. |
| **--skip-db-population** | Do not populate the database schema. |
| **--skip-gpg-key-import** | Do not import Red Hat's GPG key. |
| **--skip-ssl-cert-generation** | Do not generate the SSL certificates for the Satellite. |

## 4.3. Automated RHN Satellite Server Installation

One option of the RHN Satellite Server Installation Program allows the user to reference an answer file. This file contains pre-determined responses to all, or some, of the questions asked by the installer program. This allows the installer to run without human interaction, and may be useful in instances where Satellite deployment must be automated. An example answer file can be found in the **`install/`** directory of the CD or ISO, and is titled **`answers.txt`**.

Follow the steps below to perform an automated install with an answer file:

1. Follow steps 1 through 5 from Section 4.2, "**RHN Satellite Server Installation Program**".
2. Copy the example **`answers.txt`** file to **`/tmp/answers.txt`**

   ```
   cp answers.txt /tmp/answers.txt
   ```

3. Edit the file and add your organization's desired options.
4. Once the answer file is ready, use the **`--answer-file`** option when starting the installation process from the command line:

   ```
   ./install.pl --answer-file=/tmp/answers.txt
   ```

   The RHN Satellite Server Installation Program then looks for answers in the file. For any option no filled out in the file, the Installer Program prompts the user for the missing information.

## 4.4. Sendmail Configuration

If your RHN Satellite Server will serve Monitoring-entitled systems and you wish to acknowledge via email the alert notifications you receive, you must configure **sendmail** to properly handle incoming mail. This is required by the email redirect feature, which allows you to stop notifying users about a Monitoring-related event with a single reply.

**Important**

Some more restrictive corporate mail configurations will not allow mail to be sent from an address that is not recognized as valid. Therefore, it may be necessary to configure **`rogerthat01@{mail domain}`** as a valid email address in your corporate environment. Check with your mail systems administrator.

To configure **sendmail** correctly, run the following commands as root. First, create a symbolic link allowing sendmail to run the notification enqueuer with the following command:

```
ln -s /opt/notification/scripts/ack_enqueuer.pl /etc/smrsh/.
```

Next, edit the **`/etc/aliases`** file on the mail server and add the following line:

```
rogerthat01: | /etc/smrsh/ack_enqueuer.pl
```

Next, edit the **`/etc/mail/sendmail.mc`** file and change:

```
"DAEMON_OPTIONS(`Port=smtp,Addr=127.0.0.1, Name=MTA')dnl"
```

to:

```
"DAEMON_OPTIONS(`Port=smtp, Name=MTA')dnl"
```

Then, have the alias processed like so:

```
newaliases
```

Finally, update the **sendmail-cf** package:

```
up2date sendmail-cf
```

Note, disconnected installs must obtain this package from the ISO.

Restart sendmail:

```
service sendmail restart
```

## 4.5. MySQL Installation

This sections is applicable only if your RHN Satellite Server will serve Monitoring-entitled systems and you wish to run **MySQL** probes against them. Refer to the Probes appendix of the *RHN Reference Guide* for a list of available probes.

If you do wish to run **MySQL** probes, subscribe the Satellite to the Red Hat Enterprise Linux AS Extras channel and install the **mysql-server** package either through the RHN website or **up2date**.

Two extra packages will also be downloaded in the transaction. These are needed for the **mysql-server** package to be installed and run successfully. Once finished, your Satellite may be used to schedule **MySQL** probes.

# Chapter 5. Entitlements

The RHN Satellite Server, like RHN itself, provides all services to customers through the setting of entitlements. For RHN, entitlements are purchased by customers as needed; however, for RHN Satellite Server, entitlements are contractually agreed-upon beforehand, and they are set at installation time. All *public* channels are automatically available; the private channels that should also be made available through the Satellite are determined by the *RHN Entitlement Certificate*.

The RHN Entitlement Certificate, which contains the precise set of entitlements attributed to your organization, is provided by your Red Hat representative. Red Hat reserves the right to compare the contents of that RHN Entitlement Certificate with the database's entitlement settings at any time to ensure compliance with the terms of the customer's contract with Red Hat.

The steps referenced in this section are typically carried out by the **RHN Satellite Server Installation Program** itself and do not need to be repeated during initial installation. Instead, they are listed here for use by customers who have received a new RHN Entitlement Certificate, such as one reflecting an increase in the number of entitlements.

## 5.1. Receiving the Certificate

The RHN Entitlement Certificate is an XML document that looks something like this:

```
<?xml version="1.0" encoding="UTF-8"?>
<rhn-cert version="0.1">
  <rhn-cert-field name="product">RHN-SATELLITE-001</rhn-cert-field>
  <rhn-cert-field name="owner">Clay's Precious Satellite</rhn-cert-field>
  <rhn-cert-field name="issued">2005-01-11 00:00:00</rhn-cert-field>
  <rhn-cert-field name="expires">2005-03-11 00:00:00</rhn-cert-field>
  <rhn-cert-field name="slots">30</rhn-cert-field>
  <rhn-cert-field name="provisioning-slots">30</rhn-cert-field>
  <rhn-cert-field name="nonlinux-slots">30</rhn-cert-field>
  <rhn-cert-field name="channel-families" quantity="10" family="rhel-cluster"/>
  <rhn-cert-field name="channel-families" quantity="30" family="rhel-ws-extras"/>
  <rhn-cert-field name="channel-families" quantity="10" family="rhel-gfs"/>
  <rhn-cert-field name="channel-families" quantity="10" family="rhel-es-extras"/>
  <rhn-cert-field name="channel-families" quantity="40" family="rhel-as"/>
  <rhn-cert-field name="channel-families" quantity="30" family="rhn-tools"/>
  <rhn-cert-field name="satellite-version">3.6</rhn-cert-field>
  <rhn-cert-field name="generation">2</rhn-cert-field>
  <rhn-cert-signature>
-----BEGIN PGP SIGNATURE-----
Version: Crypt::OpenPGP 1.03

iQBGBAARAwAGBQJCAG7yAAoJEJ5yna8GlHkysOkAn07qmlUrkGKs7/5yb8H/nboG
mhHkAJ9wdmqOeKfcBa3IUDL53oNMEBP/dg==
=0Kv7
-----END PGP SIGNATURE-----
</rhn-cert-signature>
</rhn-cert>
```

**Note**

Do not try to use this RHN Entitlement Certificate; it is just an example.

The initial RHN Entitlement Certificate is generated by a member of the RHN team and emailed to a consultant or customer prior to installation. This process helps guarantee that we do not inadvertently install any RHN Satellite Servers that the RHN team does not know about.

Save the XML file to the Satellite machine in preparation for activation.

## 5.2. Uploading the RHN Entitlement Certificate

If your RHN Satellite Server is connected to the Internet, you have the option of uploading your new RHN Entitlement Certificate through the RHN website. To do this:

1. Log into https://rhn.redhat.com with your organization's Satellite-entitled account.
2. Click **Systems** in the top navigation bar and then the name of the RHN Satellite Server. You may also find the Satellite through the Satellite line item within the **Channels** category.
3. In the **System Details** page, click the **Satellite** subtab and examine the existing certificate. Ensure you have a backup of this file by copying and pasting its contents into a text editor.
4. Click **Deactivate Satellite License** at the bottom of the page. Then click **Confirm Deactivation**. You will receive a message describing the deactivation at the top of the page.
5. You may then browse to the location of your new RHN Entitlement Certificate or paste its contents into the text field provided. When done, click **Update Certificate**.

Your Satellite now has access to additional channels and client entitlements outlined in the new certificate. You may now synchronize it with the central RHN Servers. Refer to Chapter 6, *Importing and Synchronizing*.

## 5.3. Managing the RHN Certificate with RHN Satellite Activate

For disconnected Satellites or customers who prefer to work locally, Red Hat provides a command line tool for managing your RHN Entitlement Certificate and activating the Satellite using that certificate: **RHN Satellite Activate** (**rhn-satellite-activate**). This is included with the Satellite installation as part of the **rhns-satellite-tools** package.

### 5.3.1. Command Line Entitlement Options

The **rhn-satellite-activate** tool offers a handful of command line options for activating a Satellite using its RHN Entitlement Certificate:

To use these options, insert the option and the appropriate value, if needed, after the **rhn-satellite-activate** command. Refer to Section 5.3.2, “Activating the Satellite”.

### 5.3.2. Activating the Satellite

You should use the options in Table 5.1, “RHN Entitlement Certificate Options” to accomplish the following tasks in this order:

1. Validate the RHN Entitlement Certificate's sanity (or usefulness).
2. Activate the Satellite locally by inserting the RHN Entitlement Certificate into the local database.
3. Activate the Satellite remotely by inserting the RHN Entitlement Certificate into the central RHN (remote) database. This is typically accomplished during local activation but may require a second step if you chose the **--disconnected** option.

Here are some examples depicting use of the tool and these options.

To validate an RHN Entitlement Certificate's sanity only:

```
rhn-satellite-activate --sanity-only --rhn-cert=/path/to/demo.cert
```

To validate an RHN Entitlement Certificate and populate the local database:

```
rhn-satellite-activate --disconnected --rhn-cert=/path/to/demo.cert
```

To validate an RHN Entitlement Certificate and populate both the local and the RHN database:

```
rhn-satellite-activate --rhn-cert=/path/to/demo.cert
```

Once you run this final command, the Satellite is running and able to serve packages locally and synchronize with the central RHN Servers. Refer to Chapter 6, *Importing and Synchronizing*.

## 5.4. Satellite Entitlement Certificate Expiration

Satellite certificates expire at 11:59:59 PM on the date listed in the certificate's **expires** field, and new certificates become active at 12:00:00 AM on their **issued** date.

A standard grace period of seven (7) days now exists between the date of Satellite certificate expiration and when the Satellite becomes inactive. This grace period is provided in order for customers to contact Red Hat Support and obtain a new certificate. During the grace period, the following things happen:

- The Satellite remains active.
- Each user that logs into the Satellite sees a banner on their **Your RHN** page that explains that the Satellite certificate has expired.
- Once a day, for all seven days, the Satellite Administrator's email receives notification that the certificate has expired.

When the grace period is over, the Satellite becomes unavailable: users will be unable to login to the web UI and all client-side tools will present an **Expired Certificate** message.

Finally, the Satellite Administrator receives a daily email alerting them that the certificate has expired.

# Chapter 6. Importing and Synchronizing

After installing the RHN Satellite Server, you must provide it with the packages and channels to be served to client systems. This chapter explains how to import that data and keep it up to date whether the content is from RHN's central servers, local media, or from one Satellite within your organization to another.

Two tools, **RHN Satellite Exporter** and RHN Satellite Synchronization Tool, come installed as part of the **rhns-sat-tools** package.

## 6.1. Exporting with RHN Satellite Exporter

The **RHN Satellite Exporter** (**rhn-satellite-exporter**) tool exports Satellite content in an XML format that can then be imported into another identical Satellite. The content is exported into a directory specified by the user with the -d option. Once that directory has been transported to another Satellite, the **RHN Satellite Synchronization Tool** may be used to import the contents, synchronizing two Satellites.

### 6.1.1. rhn-satellite-exporter

The RHN Satellite Exporter can export the following content:

- Channel Families
- Architectures
- Channel metadata
- Blacklists
- RPMs
- RPM metadata
- Errata
- Kickstarts

The amount of time it takes **rhn-satellite-exporter** to export data is dependent on the number and size of the channels being exported. Using the **--no-packages**, **--no-kickstarts**, **--no-errata**, and **--no-rpms** options reduces the amount of time required for **rhn-satellite-exporter** to run, but also prevents potentially useful information from being exported. For that reason, these options should only be used when you are certain that you will not need the content that they exclude. Additionally, you must use the matching options for **satellite-sync** when importing the data. For example, if you use **--no-kickstarts** with **rhn-satellite-exporter** you must specify the **--no-kickstarts** option when importing the data.

When exporting an RHN base channel, you must also export the tools channel associated with that base channel in order to kickstart machines to the distribution in the base channel. For instance, if you export **rhel-i386-as-4** you must also export the **rhn-tools-rhel-4-as-i386** channel in order to kickstart machines to Red Hat Enterprise Linux 4 AS. This is because the tools channels contain the auto-kickstart packages that install packages for kickstarting a machine through the Satellite.

The **RHN Satellite Exporter** offers several command line options. To use them, insert the option and appropriate value after the **rhn-satellite-exporter** command.

**Table 6.1. RHN Satellite Exporter Options**

| Option | Description |
|---|---|
| **-d, --dir=** | Place the exported information into this directory. |
| **-c*CHANNEL_LABEL*, --channel=*CHANNEL_LABEL*** | Process data for this specific channel (specified by label) only. NOTE: the channel's *label* is NOT the same as the channel's *name*. |
| **--list-channels** | List all available channels and exit. |
| **--list-steps** | List all of the steps that rhn-satellite-exporter takes while exporting data. These can be used as values for --step. |
| **-p --print-configuration** | Print the configuration and exit. |
| **--print-report** | Print a report to the terminal when the export is complete. |
| **--no-rpms** | Do not retrieve actual RPMs. |
| **--no-packages** | Do not export RPM metadata. |
| **--no-errata** | Do not process Errata information. |
| **--no-kickstarts** | Do not process kickstart data (provisioning only). |
| **--debug-level=*LEVEL_NUMBER*** | Override the amount of messaging sent to log files and generated on the screen set in **/etc/rhn/rhn.conf**, 0-6 (2 is default). |
| **--email** | Email a report of what was exported and what errors may have occurred. |
| **--traceback-mail** | Alternative email address for --email. |
| **--db=*DB*** | Include alternate database connect string: username/password@SID. |

## 6.1.2. Exporting

To perform a **RHN Satellite Exporter** export, the following prerequisites must be met:

- The RHN Satellite Server installation must have been performed successfully.
- There must be sufficient disk space in the directory specified in the **--dir** option to contain the exported contents.

Although it is not a requirement for the export to succeed, the export will be most useful when performed on a Satellite that has populated channels.

### 6.1.2.1. Running the Export

First, be sure to configure the Satellite in the manner that you would either like to duplicate in another Satellite or back up to a storage solution. Second, select the contents you would like to export. You can choose not to export RPMs, errata, or kickstarts by using the options mentioned in Section 6.1.1, "**rhn-satellite-exporter**". Finally, execute the command as root. The following is an example command:

```
rhn-satellite-exporter --dir=/var/rhn-sat-export --no-errata
```

When finished, the export directory may be moved to another Satellite or a storage solution using **rsync**

or **scp -r**.

## 6.2. Importing with RHN Satellite Synchronization Tool

Before distributing packages via RHN Satellite Server, the packages must first be uploaded to the Satellite. This section describes the process for importing packages and other channel data.

**Important**

To populate custom channels correctly, you must first populate at least one Red Hat base channel. The **RHN Satellite Synchronization Tool** creates the necessary directory structures and permissions; without these, the custom channel tools will not work properly. For this reason, you should use these instructions to set up your base channel(s) and then refer to the *RHN Channel Management Guide* for steps to establish custom channels.

### 6.2.1. satellite-sync

The **RHN Satellite Synchronization Tool** enables an RHN Satellite Server to update its database metadata and RPM packages with those of RHN's central servers, another Satellite within your organization, or local media. To launch it, execute the following command as root:

```
satellite-sync
```

This tool can be used in a closed environment, such as the one created with a disconnected install, or it may obtain data directly over the Internet. Closed environment imports can get their data from downloaded ISOs or from the XML data generated by **RHN Satellite Exporter**.

The **RHN Satellite Synchronization Tool** works incrementally, or in steps. For it to obtain Errata information, it must first know the packages contained. For the packages to be updated, the tool must first identify the associated channel(s). For this reason, the **RHN Satellite Synchronization Tool** performs its actions in the following order:

1. **channel-families** — Import/synchronize channel family (architecture) data.
2. **channels** — Import/synchronize channel data.
3. **rpms** — Import/synchronize RPMs.
4. **packages** — Import/synchronize full package data for those RPMs retrieved successfully.
5. **errata** — Import/synchronize Errata information.

Each of these steps can be initiated individually for testing purposes with the effect of forcing the tool to stop when that step is complete. All steps that precede it, however, will have taken place. Therefore, calling the **rpms** step will automatically ensure the **channels** and **channel-families** steps take place first. To initiate an individual step, use the **--step** option, like so:

```
satellite-sync --step=rpms
```

In addition to **--step**, the **RHN Satellite Synchronization Tool** offers many other command line options. To use them, insert the option and the appropriate value after the **satellite-sync** command when launching import/synchronization.

**Table 6.2. Satellite Import/Sync Options**

| Option | Description |
|---|---|
| **-h**, **--help** | Display this list of options and exit. |
| **-d=**, **--db=*DB*** | Include alternate database connect string: username/password@SID. |
| **-m=**, **--mount-point=*MOUNT_POINT*** | Import/sync from local media mounted to the Satellite. To be used in closed environments (such as those created during disconnected installs). |
| **--list-channels** | List all available channels and exit. |
| **-c=**, **--channel=*CHANNEL_LABEL*** | Process data for this channel only. Multiple channels can be included by repeating the option. If no channels are specified, all channels on the Satellite will be freshened. |
| **-p, --print-configuration** | Print the current configuration and exit. |
| **--no-ssl** | *Not Advisable* - Turn off SSL. |
| **--step=*STEP_NAME*** | Perform the sync process *only* to the step specified. Typically used in testing. |
| **--no-rpms** | Do not retrieve actual RPMs. |
| **--no-packages** | Do not process full package data. |
| **--no-errata** | Do not process Errata information. |
| **--no-kickstarts** | Do not process kickstart data (provisioning only). |
| **--force-all-packages** | Forcibly process all package data without conducting a diff. |
| **--debug-level=*LEVEL_NUMBER*** | Override the amount of messaging sent to log files and generated on the screen set in **/etc/rhn/rhn.conf**, 0-6 (2 is default). |
| **--email** | Email a report of what was imported/synchronized to the designated recipient of traceback email. |
| **--traceback-mail=*TRACEBACK_MAIL*** | Direct sync output (from **--email**) to this email address. |
| **-s=**, **--server=*SERVER*** | Include the hostname of an alternative server to connect to for synchronization. |
| **--http-proxy=*HTTP_PROXY*** | Add an alternative HTTP proxy server in the form hostname:port. |
| **--http-proxy-username=*PROXY_USERNAME*** | Include the username for the alternative HTTP proxy server. |
| **--http-proxy-password=*PROXY_PASSWORD*** | Include the password for the alternative HTTP proxy server. |
| **--ca-cert=*CA_CERT*** | Use an alternative SSL CA certificate by including the full path and filename. |
| **--systemid=*SYSTEM_ID*** | *For debugging only* - Include path to |

| | |
|---|---|
| | alternative digital system ID. |
| **--systemid=*SYSTEM_ID*** | *For debugging only* - Include path to alternative digital system ID. |
| **--batch-size=*BATCH_SIZE*** | *For debugging only* - Set maximum batch size in percent for XML/database-import processing. Open man satellite-sync for more information. |

If no options are included, **satellite-sync** synchronizes all channels that already exist in the Satellite's database. By default, the **--step** (all steps) option is enabled.

Keep in mind that the **--channel** option requires the channel label, not its name. For instance, use "rhel-i386-as-3" not "Red Hat Enterprise Linux 3 i386." Use the **--list-channels** option to obtain a list of all channels by label. All displayed channels are available for importing and synchronizing.

## 6.2.2. Preparing for Import from Local Media

To perform the RHN Satellite Server import, the following prerequisites must be met:

- The RHN Satellite Server installation must have been performed successfully.
- The Red Hat Network Channel Content ISOs or **RHN Satellite Exporter** data must be available, or the Satellite must have access to the Internet and the RHN website.

Although it is possible to conduct the import directly from the RHN website, this should be done only if Channel Content ISOs are not available. It takes a long time to populate a channel from scratch over the Internet. For this reason, Red Hat urges you to use ISOs, if they are available, for initial import.

### 6.2.2.1. Preparing Channel Content ISOs

Channel Content ISOs are special collections that contain both packages and XML dumps of metadata. The ISO images can be downloaded from the RHN website on a machine connected to the Internet and then transferred to the Satellite. After logging in, click **Channels** in the top navigation bar and then the name of the channel for your version of RHN Satellite Server. Click the **Downloads** tab and use the instructions on the page to obtain the Channel Content ISOs, available by version of Red Hat Enterprise Linux. If the desired Channel Content ISOs do not appear, ensure your RHN Entitlement Certificate has been uploaded to RHN and correctly identifies the target channels.

Channel Content ISOs are mounted and then copied to a temporary repository directory. Before mounting the ISOs, ensure the temporary repository has enough disk space to copy all the contents into a single directory. For a single channel, the approximate required space is 3 GB. The process to copy Channel Content ISOs is to mount each one, copy its contents to the temporary repository, and then unmount the ISO. Each channel consists of several ISOs. Once finished, the administrator should delete the temporary directory and all of its contents. Follow these steps:

1. Log into the machine as root.
2. Insert the first Channel Content ISO that has been burned to disc.
3. Create a directory in **/mnt/** to store the file(s) with the command:

```
mkdir /mnt/import/
```

4. Mount the ISO file from within the directory containing it using the command:

```
mount iso_filename /mnt/import -o loop
```

5. Create a target directory for the files, such as:

```
mkdir /var/rhn-sat-import/
```

6. This sample command assumes the administrator wants to copy the contents of the ISO (mounted in **/mnt/import/**) into **/var/rhn-sat-import/**:

```
cp -ruv /mnt/import/* /var/rhn-sat-import/
```

7. Then unmount **/mnt/import** in preparation for the next CD or ISO:

```
umount /mnt/import
```

8. Repeat these steps for each Channel Content ISO of every channel to be imported.

#### 6.2.2.2. Preparing RHN Satellite Exporter Data

In order to perform the import from data previously exported using RHN Satellite Exporter, you must first copy that data onto the local system. Steps such as the following will enable you to procede to running the import as described in Section 6.2.3, “Running the Import”.

1. Log into the machine as root.
2. Create a target directory for the files, such as:

```
mkdir /var/rhn-sat-import/
```

3. Make the export data available on the local machine in the directory created in the previous step. This can be done by copying the data directly, or by mounting the data from another machine using NFS. It is perhaps easiest to copy the data into the new directory with a command such as the following:

```
scp -r root@storage.example.com:/var/sat-backup/* /var/rhn-sat-import
```

Now that the data is available, you can procede to performing the import.

### 6.2.3. Running the Import

The **rhns-satellite-tools** package provides the **satellite-sync** program for managing all package, channel, and errata imports and synchronizations.

The following process assumes in the previous step the user has copied all data to **/var/rhn-sat-import**.

The first step in importing channels into the database is listing the channels available for import. This is accomplished with the command:

```
satellite-sync --list-channels --mount-point /var/rhn-sat-import
```

The next step is to initiate the import of a specific channel. Do this using a channel label presented in the previous list. The command will look like:

```
satellite-sync -c rhel-i386-as-3 --mount-point /var/rhn-sat-import
```

**Note**

Importing package data can take up to two hours per channel. You may begin registering systems to channels as soon as they appear in the RHN Satellite Server's website. No packages are necessary for registration, although updates cannot be retrieved from the Satellite until the channel is completely populated.

You may repeat this step for each channel or include them all within a single command by passing each channel label preceded by an additional **-c** flag, like so:

```
satellite-sync -c channel-label-1 \
               -c channel-label-2 \
--mount-point /var/rhn-sat-import
```

This conducts the following tasks in this order:

1. Populating the tables describing common features for channels (*channel families*). This can also be accomplished individually by passing the **--step=*channel-families*** option to **satellite-sync**.
2. Creating a particular channel in the database and importing the metadata describing the channel. Individually, use the **--step=*channels*** option.
3. Moving the RPM packages from the temporary repository into their final location. Individually, use the **--step=*rpms*** option.
4. Parsing the header metadata for each package in the channel, uploading the package data, and associating it with the channel. Individually, use the **--step=*packages*** option.
5. Identifying Errata associated with the packages and including them in the repository. Individually, use the **--step=*errata*** option.

After running the preceding sample command, the population of the channel should be complete. All of the packages should have been moved out of the repository; this can be verified with the command **cd /var/rhn-sat-import/; ls -alR | grep rpm**. If all RPMs have been installed and moved to their permanent locations, then this count will be zero, and the administrator may safely remove the temporary repository (in this case, **/var/rhn-sat-import/**).

## 6.3. Synchronizing

An update channel is only as useful as the freshness of the information in that channel. Since the RHN Satellite Server is designed to be a standalone environment, any update advisories published by RHN must be manually imported and synchronized by the administrator of the RHN Satellite Server.

During synchronization over the Internet, the **RHN Satellite Synchronization Tool** performs the following steps:

1. Connects over SSL to central RHN Servers, authenticates itself as an RHN Satellite Server, and triggers an export of RHN data — *unless* a local mount point for RHN-exported data is specified, in which case no connection is necessary. Refer to Section 6.3.2, “Synchronizing Errata and Packages via Local Media” for an explanation.

2. Examines the export and identifies differences between the RHN Satellite Server data set and the exported RHN data set. For a particular channel, the following information is analyzed:
   - Channel metadata
   - Metadata of all packages in that channel
   - Metadata for all Errata that affect that channel

**Note**

All analysis is performed on the RHN Satellite Server; the central RHN Servers deliver only an export of its channel information and remain ignorant of any details regarding the RHN Satellite Server.

3. After the analysis of the export data, any differences are imported into the RHN Satellite Server database. Please note that importing new packages may take variable lengths of time. For a large update, an import can take many hours.

The **satellite-sync** command can be used in two modes: via RHN and via local media.

### 6.3.1. Synchronizing Errata and Packages Directly via RHN

For customers who want to sync data as frequently as possible and who can initiate connections outside of their own environments, the satellite sync can be run over the Internet through SSL. This is the default setting for the satellite sync script. For example:

```
satellite-sync -c rhel-i386-as-3
```

This connects to central Red Hat Network Servers and performs the process described above. Multiple channels can be included by repeating the option. If no channels are specified, all channels on the Satellite will be refreshed.

### 6.3.2. Synchronizing Errata and Packages via Local Media

For customers who cannot connect their Satellite directly to RHN, Red Hat recommends downloading Channel Content ISOs to a separate, Internet-connected system and then transferring them to the Satellite. Refer to Section 6.2.2.1, “Preparing Channel Content ISOs” for instructions on downloading the ISOs. For ease of import, we recommend that the data be copied from media directly into a common repository through a command such as the following:

```
cp -rv /mnt/cdrom/* /var/rhn-sat-sync/
```

Then, the following command:

```
satellite-sync -c rhel-i386-as-3 --mount-point /var/rhn-sat-sync
```

This can be used to perform the sync process described above, using the dump files in **/var/rhn-sat-sync** to perform the necessary comparisons and imports. See Section 6.2.3, “Running the Import” for precise steps.

# Chapter 7. Troubleshooting

This chapter provides tips for determining the cause of and resolving the most common errors associated with RHN Satellite Server. If you need additional help, contact Red Hat Network support at https://rhn.redhat.com/help/contact.pxt. Log in using your Satellite-entitled account to see your full list of options.

In addition, you may package configuration information and logs from the Satellite and send them to Red Hat for further diagnosis. Refer to Section 7.6, “Satellite Debugging by Red Hat” for instructions.

## 7.1. Log Files

Virtually every troubleshooting step should start with a look at the associated log file or files. These provide invaluable information about the activity that has taken place on the device or within the application that can be used to monitor performance and ensure proper configuration. See Table 7.1, “Log Files” for the paths to all relevant log files:

**Table 7.1. Log Files**

| Component/Task | Log File Location |
|---|---|
| Apache Web server | **`/var/log/httpd/`** directory |
| RHN Satellite Server | **`/var/log/rhn/`** directory |
| **RHN Satellite Server Installation Program** | **`/var/log/rhn_satellite_install.log`** |
| Database installation - *Embedded Database* | **`/var/log/rhn/rhn-database-installation.log`** |
| Database population | **`/var/log/rhn/populate_db.log`** |
| **RHN Satellite Synchronization Tool** | **`/var/log/rhn/rhn_server_satellite.log`** |
| Monitoring infrastructure | **`/home/nocpulse/var/`** directory |
| Monitoring notifications | **`/opt/notification/var/`** directory |
| **RHN DB Control** - *Embedded Database* | **`/var/log/rhn/rhn_database.log`** |
| **RHN Task Engine** (taskomatic) | **`/var/log/messages`** |
| **Red Hat Update Agent** | **`/var/log/up2date`** |
| XML-RPC transactions | **`/var/log/rhn/rhn_server_xmlrpc.log`** |

## 7.2. General Problems

To begin troubleshooting general problems, examine the log file or files related to the component exhibiting failures. A useful exercise is to issue the **`tail -f`** command for all log files and then run **`up2date --list`**. You should then examine all new log entries for potential clues.

A common issue is full disk space. An almost sure sign of this is the appearance of halted writing in the log files. If logging stopped during a write, such as mid-word, you likely have filled disks. To confirm this, run this command and check the percentages in the **`Use%`** column:

```
df -h
```

In addition to log files, you can obtain valuable information by retrieving the status of your RHN Satellite Server and its various components. This can be done with the command:

```
service rhn-satellite status
```

In addition, you can obtain the status of components such as the Apache Web server and the **RHN Task Engine** individually. For instance, to view the status of the Apache Web server, run the command:

```
service httpd status
```

If the Apache Web server isn't running, entries in your **/etc/hosts** file may be incorrect. Refer to Section 7.3, “Host Not Found/Could Not Determine FQDN” for a description of this problem and possible solutions.

To obtain the status of the **RHN Task Engine**, run the command:

```
service taskomatic status
```

For more information, see Section 8.7.1.1, “Maintaining the **RHN Task Engine**”.

To obtain the status of the Satellite's Embedded Database, if it exists, run the command:

```
service rhn-database status
```

To determine the version of your database schema, run the command:

```
rhn-schema-version
```

To derive the character set types of your Satellite's database, run the command:

```
rhn-charsets
```

If the administrator is not getting email from the RHN Satellite Server, confirm the correct email addresses have been set for **traceback_mail** in **/etc/rhn/rhn.conf**.

If the traceback mail is marked from dev-null@rhn.redhat.com and you would like the address to be valid for your organization, include the **web.default_mail_from** option and appropriate value in **/etc/rhn/rhn.conf**.

If importing/synchronizing a channel fails and you can't recover it in any other way, run this command to delete the cache:

```
rm -rf temporary-directory
```

Note that Section 6.2.2.1, “Preparing Channel Content ISOs” suggested that this temporary directory be **/var/rhn-sat-import/**.

Next, restart the importation or synchronization.

If **up2date** or the push capability of the RHN Satellite Server ceases to function, it is possible that old

log files may be at fault. Stop the jabberd daemon before removing these files. To do so, issue the following commands as root:

```
service jabberd stop
cd /var/lib/jabberd
rm -f _db*
service jabberd start
```

## 7.3. Host Not Found/Could Not Determine FQDN

Because RHN configuration files rely exclusively on fully qualified domain names (FQDN), it is imperative key applications are able to resolve the name of the RHN Satellite Server into an IP address. **Red Hat Update Agent**, **Red Hat Network Registration Client**, and the Apache Web server are particularly prone to this problem with the RHN applications issuing errors of "host not found" and the Web server stating "Could not determine the server's fully qualified domain name" upon failing to start.

This problem typically originates from the **/etc/hosts** file. You may confirm this by examining **/etc/nsswitch.conf**, which defines the methods and the order by which domain names are resolved. Usually, the **/etc/hosts** file is checked first, followed by Network Information Service (NIS) if used, followed by DNS. One of these has to succeed for the Apache Web server to start and the RHN client applications to work.

To resolve this problem, identify the contents of the **/etc/hosts** file. It may look like this:

```
127.0.0.1 this_machine.example.com this_machine localhost.localdomain \
localhost
```

First, in a text editor, remove the offending machine information, like so:

```
127.0.0.1 localhost.localdomain.com localhost
```

Then, save the file and attempt to re-run the RHN client applications or the Apache Web server. If they still fail, explicitly identify the IP address of the Satellite in the file, such as:

```
127.0.0.1 localhost.localdomain.com localhost
123.45.67.8 this_machine.example.com this_machine
```

Replace the value here with the actual IP address of the Satellite. This should resolve the problem. Keep in mind, if the specific IP address is stipulated, the file will need to be updated when the machine obtains a new address.

## 7.4. Connection Errors

A common connection problem, indicated by SSL_CONNECT errors, is the result of a Satellite being installed on a machine whose time had been improperly set. During the Satellite installation process, SSL certificates are created with inaccurate times. If the Satellite's time is then corrected, the certificate start date and time may be set in the future, making it invalid.

To troubleshoot this, check the date and time on the clients and the Satellite with the following command:

```
date
```

The results should be nearly identical for all machines and within the "notBefore" and "notAfter" validity windows of the certificates. Check the client certificate dates and times with the following command:

```
openssl x509 -dates -noout -in /usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT
```

Check the Satellite server certificate dates and times with the following command:

```
openssl x509 -dates -noout -in /etc/httpd/conf/ssl.crt/server.crt
```

By default, the server certificate has a one-year life while client certificates are good for 10 years. If you find the certificates are incorrect, you can either wait for the valid start time, if possible, or create new certificates, preferably with all system times set to GMT.

The following measures can be used to troubleshoot general connection errors:

- Attempt to connect to the RHN Satellite Server's database at the command line using the correct connection string as found in **/etc/rhn/rhn.conf**:

  ```
  sqlplus username/password@sid
  ```

- Ensure the RHN Satellite Server is using Network Time Protocol (NTP) and set to the appropriate time zone. This also applies to all client systems and the separate database machine in RHN Satellite Server with Stand-Alone Database.
- Confirm the correct package:

  ```
  7 rhn-org-httpd-ssl-key-pair-MACHINE_NAME-VER-REL.noarch.rpm
  ```

  is installed on the RHN Satellite Server and the corresponding **rhn-org-trusted-ssl-cert-*.noarch.rpm** or raw CA SSL public (client) certificate is installed on all client systems.
- Verify the client systems are configured to use the appropriate certificate.
- If also using one or more RHN Proxy Servers, ensure each Proxy's SSL certificates are prepared correctly. The Proxy should have both its own server SSL key-pair and CA SSL public (client) certificate installed, since it will serve in both capacities. Refer to the SSL Certificates chapter of the *RHN Client Configuration Guide* for specific instructions.
- Make sure client systems are not using firewalls of their own, blocking required ports as identified in Section 2.4, “Additional Requirements”.

## 7.5. Updated Software Components

Do not subscribe your RHN Satellite Server to any of the following child channels available from RHN's central servers:

- Red Hat Developer Suite
- Red Hat Application Server
- Red Hat Extras

Subscribing to these channels and updating your Satellite (such as by running **up2date**), may install newer, incompatible versions of critical software components, causing the Satellite to fail.

## 7.6. Satellite Debugging by Red Hat

If you've exhausted these troubleshooting steps or want to defer them to Red Hat Network professionals, Red Hat recommends you take advantage of the strong support that comes with RHN Satellite Server. The most efficient way to do this is to aggregate your Satellite's configuration parameters, log files, and database information and send this package directly to Red Hat.

RHN provides a command line tool explicitly for this purpose: The **Satellite Diagnostic Info Gatherer**, commonly known by its command **`satellite-debug`**. To use this tool, issue the command as root. You will see the pieces of information collected and the single tarball created, like so:

```
[root@miab root]# satellite-debug
Collecting and packaging relevant diagnostic information.
Warning: this may take some time...
    * copying configuration information
    * copying logs
    * querying RPM database (versioning of RHN Satellite, etc.)
    * querying schema version and database character sets
    * get diskspace available
    * timestamping
    * creating tarball (may take some time): /tmp/satellite-debug.tar.bz2
    * removing temporary debug tree

Debug dump created, stored in /tmp/satellite-debug.tar.bz2
Deliver the generated tarball to your RHN contact or support channel.
```

Once finished, email the new file from the **`/tmp/`** directory to your Red Hat representative for immediate diagnosis.

# Chapter 8. Maintenance

Because of the RHN Satellite Server's unique closed environment, its users are provided with abilities not available to any other Red Hat Network customers. In addition, the Satellite itself also requires maintenance. This chapter discusses the procedures that should be followed to carry out administrative functions outside of standard use, as well as to apply patches to the RHN Satellite Server.

## 8.1. Managing the Satellite Service

Since the RHN Satellite Server consists of a multitude of individual components, Red Hat provides a master service that allows you to stop, start, or retrieve status information from the various services in the appropriate order: **`rhn-satellite`**. This helper service accepts all of the typical commands:

```
service rhn-satellite start
service rhn-satellite stop
service rhn-satellite restart
service rhn-satellite status
```

Use the **`rhn-satellite`** service to shut down and bring up the entire RHN Satellite Server and retrieve status messages from all of its services at once.

## 8.2. Updating the Satellite

If any critical updates are made to RHN Satellite Server, they will be released in the form of an Erratum for the RHN Satellite Server.

For RHN Satellite Server systems that may be connected to the Internet, the best method for applying these Errata Updates is using the **Red Hat Update Agent** via Red Hat Network. Since the RHN Satellite Server is subscribed to Red Hat Network during initial installation, the user should be able to run **`up2date -u`** on the RHN Satellite Server or use the website at https://rhn.redhat.com to apply the updates.

**Important**

Apache RPMs do not restart the httpd service upon installation. Therefore, after conducting a full update of an RHN Satellite Server (such as with the command **`up2date -uf`**), Apache may fail. To avoid this, make sure you restart the httpd service after upgrading it.

For RHN Satellite Server systems that may not be connected to the Internet, the packages themselves may be retrieved using a customer account at https://rhn.redhat.com. Then, they can be applied manually by the customer according to instructions in the Errata Advisory.

**Warning**

It is *very* important to read the Errata Advisory before applying any RHN Satellite Server Errata Updates. Additional configuration steps may be required to apply certain RHN Satellite Server updates, especially if they involve the database. In such cases, the advisory will contain specific and detailed information about necessary steps that may be required.

If instead of installing new Satellite packages, you are attempting to update the server's RHN Entitlement Certificate, such as to increase its number of client systems, refer to Chapter 5, *Entitlements* for instructions.

## 8.3. Backing Up the Satellite

Backing up an RHN Satellite Server can be done in several ways. Regardless of the method chosen, the associated database also needs to be backed up. For the Stand-Alone Database, consult your organization's database administrator. For the Embedded Database, refer to Section 8.4, "Using **RHN DB Control**" for a complete description of this process and the options available.

Here are the minimum files and directories Red Hat recommends backing up:

- **`/rhnsat/`** - Embedded Database only (never to be backed up while the database is running - refer to Section 8.4.2, "Backing up the Database")
- **`/etc/sysconfig/rhn/`**
- **`/etc/rhn/`**
- **`/etc/sudoers`**
- **`/etc/tnsnames.ora`**
- **`/var/www/html/pub/`**
- **`/var/satellite/redhat/1`** - custom RPMs
- **`/etc/pxtdb.conf`** - pertains only to RHN Satellite Server 1.1.x.
- **`/root/.gnupg/`**
- **`/root/ssl-build/`**

If possible, back up **`/var/satellite/`**, as well. In case of failure, this will save lengthy download time. Since **`/var/satellite/`** (specifically **`/var/satellite/redhat/NULL/`**) is primarily a duplicate of Red Hat's RPM repository, it can be regenerated with **`satellite-sync`**. Red Hat recommends the entire **`/var/satellite/`** tree be backed up. In the case of disconnected satellites, **`/var/satellite/`** *must* be backed up.

Backing up only these files and directories would require reinstalling the RHN Satellite Server ISO RPMs and reregistering the Satellite. In addition, Red Hat packages would need to be resynchronized using the **`satellite-sync`** tool. Finally, you would have to reinstall the **`/root/ssl-build/\ rhn-org-httpd-ssl-key-pair-`*`MACHINE_NAME-VER-REL`*`.noarch.rpm`**.

Another method would be to back up all of the files and directories mentioned above but reinstall the RHN Satellite Server without reregistering it. During the installation, cancel or skip the RHN registration and SSL certificate generation sections.

The final and most comprehensive method would be to back up the entire machine. This would save time in downloading and reinstalling but would require additional disk space and back up time.

## 8.4. Using RHN DB Control

RHN Satellite Server with Embedded Database requires a utility for managing that database. Red Hat provides just such a tool: **RHN DB Control**. This command line utility allows you to do everything from make, verify, and restore backups to obtain database status and restart it when necessary. You *must* be the oracle user to invoke **RHN DB Control**. To begin, switch to the oracle user:

```
su - oracle
```

Next, issue the following command:

```
db-control option
```

### 8.4.1. DB Control Options

**RHN DB Control** offers many command line options. To use them, as oracle insert the option and the appropriate value, if needed, after the **db-control** command.

**Table 8.1. RHN DB Control Options**

| Option | Description |
|---|---|
| **help** | Lists these **db-control** options with additional details. |
| **backup** ***DIRNAME*** | Backs up the database to the directory specified. |
| **examine** ***DIRNAME*** | Examines the contents of a backup directory. Returns the timestamp of backup creation and reports on its contents. |
| **extend** | Increase the RHN Oracle tablespace |
| **report** | Reports on current usage of database space. |
| **restore** ***DIRNAME*** | Restores the database from backup kept in DIRNAME. Database must be stopped for this command to run successfully. |
| **start** | Starts the database instance. This can also be accomplished by issuing the **service rhn-database start** command as root. |
| **status** | Shows the current status of the database, either "running" or "offline". |
| **stop** | Stops the database instance. This can also be accomplished by issuing the **service rhn-database stop** command as root. |
| **tablesizes** | Show space report for each table |
| **verify** ***DIRNAME*** | Verifies the contents of the backup kept in DIRNAME. This command checks the md5sums of each of the files kept in the backup. |

### 8.4.2. Backing up the Database

Red Hat recommends performing nightly backups of the Embedded Database and moving the resulting directory to another system via NFS, SCP, FTP, etc. Preferably, this backup system resides off-site. To conduct a backup, shut down the database and related services first by issuing the following command as root:

```
service rhn-satellite stop
```

Then switch to the oracle user and issue this command to initiate the backup:

```
db-control backup DIRNAME
```

Backup files are stored in the directory specified. Note that this is a cold backup; the database must be stopped before running this command. This process takes several minutes. The first backup is a good indicator of how long subsequent backups will take.

Once the backup is complete, return to root user mode and restart the database and related services with the following command:

```
service rhn-satellite start
```

You should then copy that backup to another system using **rsync** or another file-transfer utility. Red Hat strongly recommends scheduling the backup process automatically using cron jobs. For instance, back up the system at 3 a.m. and then copy the backup to the separate repository (partition, disk, or system) at 6 a.m.

### 8.4.3. Verifying the Backup

Backing up the Embedded Database is useful only if you can ensure the integrity of the resulting backup. **RHN DB Control** provides two methods for reviewing backups, one brief, one more detailed. To conduct a quick check of the backup's timestamp and determine any missing files, issue this command as oracle:

```
db-control examine DIRNAME
```

To conduct a more thorough review, including checking the md5sum of each of the files in the backup, issue this command as oracle:

```
db-control verify DIRNAME
```

### 8.4.4. Restoring the Database

**RHN DB Control** makes Embedded Database restoration a relatively simple process. As in the creation of backups, you will need to shut down the database and related services first by issuing the following commands in this order as root:

```
service rhn-satellite stop
```

Then switch to the oracle user and issue this command, including the directory containing the backup, to begin the restoration:

```
db-control restore DIRNAME
```

This not only restores the Embedded Database but first verifies the contents of the backup directory using md5sums. Once the restoration is complete, return to root user mode and restart the database and related services with these commands in this order:

```
service rhn-satellite start
```

## 8.5. Cloning the Satellite with Embedded DB

You may limit outages caused by hardware or other failures by cloning the Satellite with Embedded

Database in its entirety. The secondary Satellite machine can be prepared for use if the primary fails. To clone the Satellite, perform these tasks:

1. Install RHN Satellite Server with Embedded Database (and a base install of Red Hat Enterprise Linux AS) on a separate machine, skipping the SSL Certificate generation step.
2. Back up the primary Satellite's database daily using the commands described in Section 8.4.2, “Backing up the Database”. If this is done, only changes made the day of the failure will be lost.
3. Establish a mechanism to copy the backup to the secondary Satellite and keep these repositories synchronized using a file transfer program such as **rsync**. If you're using a SAN, copying isn't necessary.
4. Use **RHN DB Control**'s **`restore`** option to import the duplicate data.
5. If the primary Satellite fails, transfer the SSL certificates from it to the secondary. Refer to the *Deploying the CA SSL Public Certificate to Clients* section of the *RHN Client Configuration Guide* for precise instructions.
6. Change DNS to point to the new machine or configure your load balancer appropriately.

## 8.6. Establishing Redundant Satellites with Stand-Alone DB

In keeping with the cloning option available to Satellite with Embedded Database, you may limit outages on Satellites with Stand-Alone Database by preparing redundant Satellites. Unlike cloning a Satellite with Embedded Database, redundant Satellites with Stand-Alone Database may be run as active, as well as standby. This is entirely up to your network topology and is independent of the steps listed here.

To establish this redundancy, first install the primary Satellite normally, except the value specified in the Common Name field for the SSL certificate must represent your high-availability configuration, rather than the hostname of the individual server. Then:

1. Prepare the Stand-Alone Database for failover using Oracle's recommendations for building a fault-tolerant database. Consult your database administrator.
2. Install RHN Satellite Server with Stand-Alone Database (and a base install of Red Hat Enterprise Linux AS) on a separate machine, skipping the database configuration, database schema, SSL certificate, and bootstrap script generation steps. Include the same RHN account and database connection information provided during the initial Satellite install and register the new Satellite.

   If your original SSL certificate does not take your high-availability solution into account, you may create a new one with a more appropriate Common Name value now. In this case, you may also generate a new bootstrap script that captures this new value.
3. After installation, copy the following files from the primary Satellite to the secondary Satellite:
   - **`/etc/rhn/rhn.conf`**
   - **`/etc/tnsnames.ora`**
   - **`/var/www/rhns/server/secret/rhnSecret.py`**
4. Copy and install the server-side SSL certificate RPMs from the primary Satellite to the secondary. Refer to the Sharing Certificates section of the *RHN Client Configuration Guide* for precise instructions. Remember, the Common Name value must represent the combined Satellite solution, not a single machine's hostname.

   If you generated a new SSL certificate during Satellite installation that included a new Common Name value, copy the SSL certificate RPMs from the secondary to the primary Satellite and redistribute the client-side certificate. If you also created another bootstrap script, you may use this to install the certificate on client systems.
5. If you did not create a new bootstrap script, copy the contents of

**`/var/www/html/pub/bootstrap/`** from the primary Satellite to the secondary. If you did generate a new one, copy that directory's contents to the primary Satellite.

6. Turn off the **RHN Task Engine** on the secondary Satellite with the following command:

```
/sbin/service taskomatic stop
```

   You may use custom scripting or other means to establish automatic start-up/failover of the **RHN Task Engine** on the secondary Satellite. Regardless, it will need to be started upon failover.

7. Share channel package data (by default located in **`/var/satellite`**) between the Satellites over some type of networked storage device. This eliminates data replication and ensures a consistent store of data for each Satellite.

8. Make the various Satellites available on your network via Common Name and a method suiting your infrastructure. Options include round-robin DNS, a network load balancer, and a reverse-proxy setup.

## 8.7. Conducting Satellite-Specific Tasks

Using a RHN Satellite Server is quite similar to using the hosted version of Red Hat Network. For this reason, you should consult the *RHN Reference Guide* to obtain detailed instructions to standard tasks, such as editing System Profiles and updating packages. Tasks directly related to managing custom channels and Errata are covered in the *RHN Channel Management Guide*. This section seeks to explain activities available only to Satellite customers.

### 8.7.1. Using the `Tools` menu

In addition to the standard categories available to all users through the top navigation bar, Satellite Organization Administrators also have access to a **`Tools`** menu. Clicking this opens the **`RHN Internal Tools`** page.

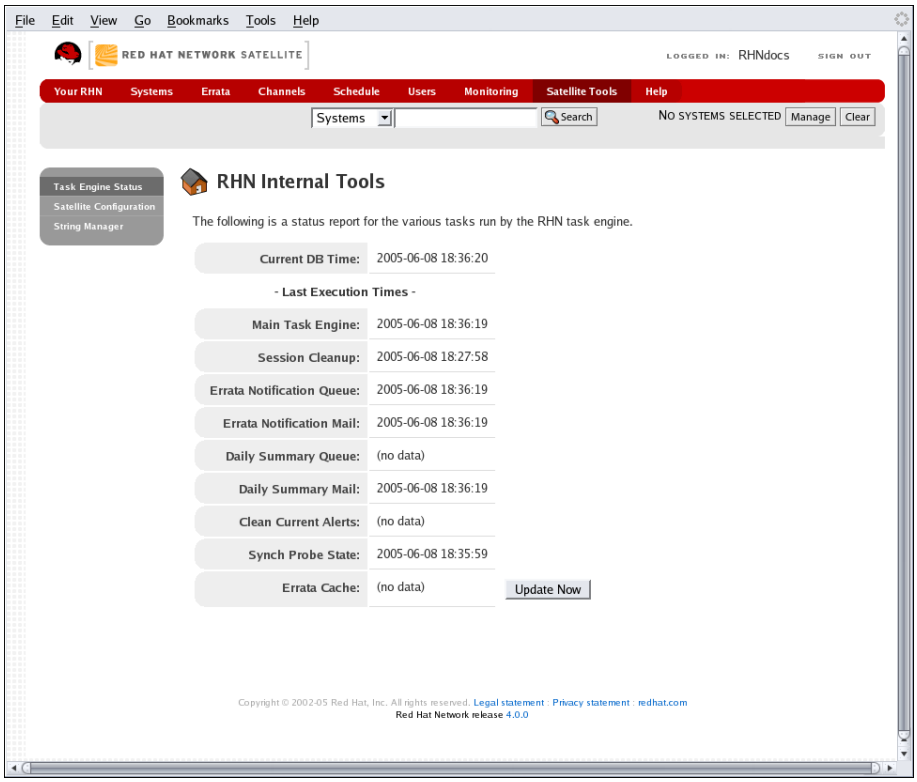

File Edit View Go Bookmarks Tools Help
RED HAT NETWORK SATELLITE
LOGGED IN: RHNdocs SIGN OUT
Your RHN Systems Errata Channels Schedule Users Monitoring Satellite Tools Help
Systems Search
NO SYSTEMS SELECTED Manage Clear
Task Engine Status
Satellite Configuration
String Manager
RHN Internal Tools
The following is a status report for the various tasks run by the RHN task engine.
Current DB Time: 2005-06-08 18:36:20
- Last Execution Times -
Main Task Engine: 2005-06-08 18:36:19
Session Cleanup: 2005-06-08 18:27:58
Errata Notification Queue: 2005-06-08 18:36:19
Errata Notification Mail: 2005-06-08 18:36:19
Daily Summary Queue: (no data)
Daily Summary Mail: 2005-06-08 18:36:19
Clean Current Alerts: (no data)
Synch Probe State: 2005-06-08 18:35:59
Errata Cache: (no data) Update Now
Copyright © 2002-05 Red Hat, Inc. All rights reserved. Legal statement : Privacy statement : redhat.com
Red Hat Network release 4.0.0

**Figure 8.1. Internal Tools**

To refresh the view of channels that have been updated but do not yet reflect those modifications on the Satellite website, click the **Update Errata cache now** link on this page.

#### 8.7.1.1. Maintaining the RHN Task Engine

The default display shows the status of the **RHN Task Engine**. This tool is a daemon that runs on the Satellite server itself and performs routine operations, such as database cleanup, Errata mailings, etc., that must be performed in the background. The page displays the execution times for various activities carried out by the daemon.

Administrators should ensure the **RHN Task Engine** stays up and running. If this daemon hangs for any reason, it can be restarted using it's filename, **taskomatic**. As root, run the command:

```
/sbin/service taskomatic restart
```

Other service commands can also be used, including **start**, **stop**, and **status**.

#### 8.7.1.2. Accessing the String Manager

The **Tools** menu also offers a **String Manager** function. This page allows you to edit footers, headers and other universal information displayed in emails, error messages and elsewhere.

### 8.7.2. Deleting Users

Because of the isolated environment in which RHN Satellite Servers operate, Satellite customers have been granted the ability to delete users. To access this functionality, click **Users** in the top navigation bar of the RHN website. In the resulting User List, click the name of the user to be removed. This takes you to the **User Details** page. Click the **delete user** link at the top-right corner of the page.

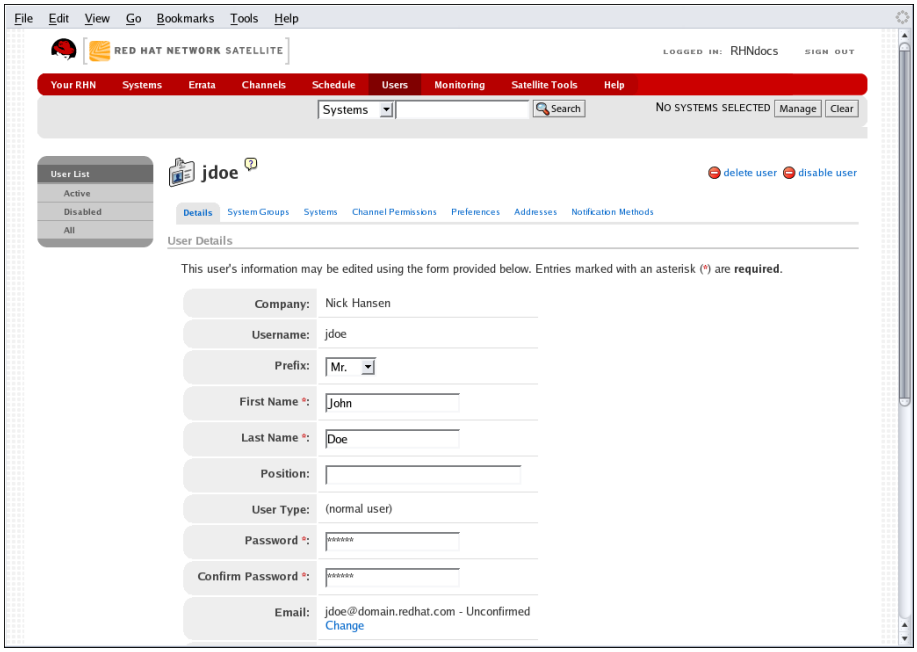
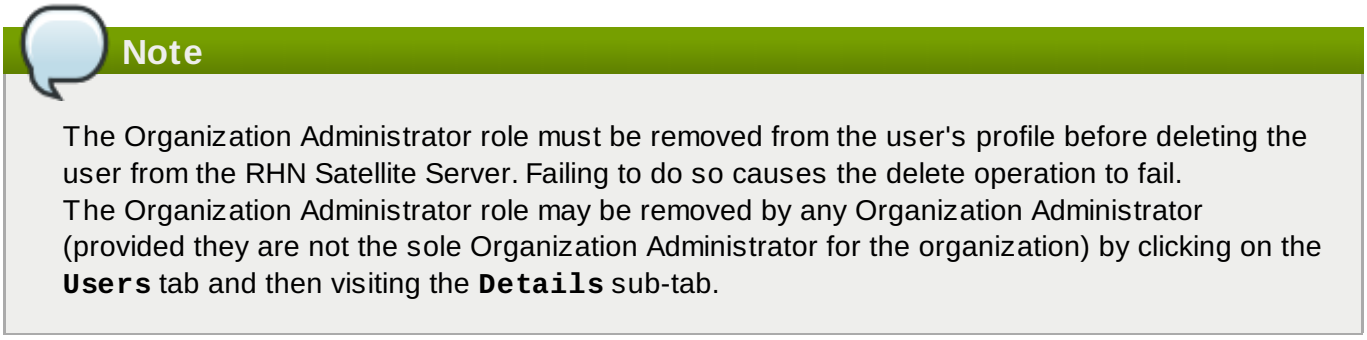

File Edit View Go Bookmarks Tools Help
RED HAT NETWORK SATELLITE
LOGGED IN: RHNdocs SIGN OUT
Your RHN Systems Errata Channels Schedule Users Monitoring Satellite Tools Help
Systems Search
NO SYSTEMS SELECTED Manage Clear
User List
Active
Disabled
All
jdoe
delete user disable user
Details System Groups Systems Channel Permissions Preferences Addresses Notification Methods
User Details
This user's information may be edited using the form provided below. Entries marked with an asterisk (*) are required.
Company: Nick Hansen
Username: jdoe
Prefix: Mr.
First Name *: John
Last Name *: Doe
Position:
User Type: (normal user)
Password *:
Confirm Password *:
Email: jdoe@domain.redhat.com - Unconfirmed
Change

**Figure 8.2. User Deletion**

A confirmation page appears explaining that this removal is permanent. To continue, click **Delete User** at the bottom-right corner of the page.



**Note**

The Organization Administrator role must be removed from the user's profile before deleting the user from the RHN Satellite Server. Failing to do so causes the delete operation to fail.
The Organization Administrator role may be removed by any Organization Administrator (provided they are not the sole Organization Administrator for the organization) by clicking on the **`Users`** tab and then visiting the **`Details`** sub-tab.

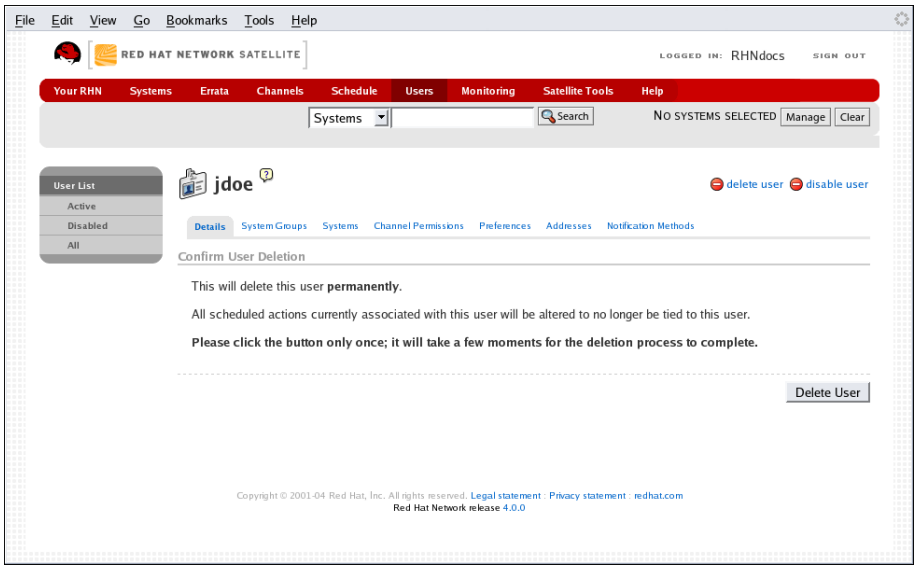



**Figure 8.3. User Delete Confirmation**

Many other options exist for managing users. You can find instructions for them in the RHN website chapter of the *RHN Reference Guide*.

## 8.8. Automating Synchronization

Manually synchronizing the RHN Satellite Server repository with Red Hat Network can be a time-intensive task. United States business hours tend to be the peak usage time for Red Hat Network, so synchronization at that time may be slow. For these reasons, Red Hat encourages you to automate synchronization at other times to better balance load and ensure quick synchronization. Continental United States business hours are roughly 8:00 AM to 9:00 PM EST (UTC -5), due to four time zones, Monday through Friday. These hours may vary seasonally by one hour. *Further, Red Hat strongly recommends that synchronization occur randomly for best performance.*

This automation can be set easily by the addition of a simple cron job. To do this, edit the crontab as root:

```
crontab -e
```

This opens the crontab in a text editor, by default Vi. Another editor can be used by first changing the **`EDITOR`** variable, like so: **`export EDITOR=gedit`**.

Once opened, use the first five fields (minute, hour, day, month, and weekday) to schedule the synchronization. Remember, hours use military time. Edit the crontab to include random synchronization,

like so:

```
0 1 * * * perl -le 'sleep rand 9000' && satellite-sync --email >/dev/null \
2>/dev/null
```

This particular job will run randomly between 1:00 a.m. and 3:30 a.m. system time each night and redirect **stdout** and **stderr** from **cron** to prevent duplicating the more easily read message from **satellite-sync**. Options other than **--email** can also be included. Refer to Table 6.2, "Satellite Import/Sync Options" for the full list of options. Once you exit from the editor, the modified crontab is installed immediately.

## 8.9. Implementing PAM Authentication

As security measures become increasingly complex, administrators must be given tools that simplify their management. For this reason, RHN Satellite Server supports network-based authentication systems via Pluggable Authentication Modules (PAM). PAM is a suite of libraries that helps system administrators integrate the Satellite with a centralized authentication mechanism, thus eliminating the need for remembering multiple passwords.

RHN Satellite Server supports LDAP, Kerberos, and other network-based authentication systems via PAM. To enable the Satellite to use PAM and your organization's authentication infrastructure, follow the steps below.

**Note**

To ensure that PAM authentication functions properly, install the pam-devel package.

Set up a PAM service file (usually **/etc/pam.d/rhn-satellite**) and have the Satellite use it by adding the following line to **/etc/rhn/rhn.conf**:

```
pam_auth_service = rhn-satellite
```

This assumes the PAM service file is named **rhn-satellite**.

To enable a user to authenticate against PAM, select the checkbox labeled **Pluggable Authentication Modules (PAM)**. It is positioned below the password and password confirmation fields on the **Create User** page.

As an example, for a Red Hat Enterprise Linux 4 i386 system, to authenticate against Kerberos one could put the following in **/etc/pam.d/rhn-satellite**:

```
#%PAM-1.0
auth        required      pam_env.so
auth        sufficient    pam_krb5.so no_user_check
auth        required      pam_deny.so
account     required      pam_krb5.so no_user_check
```

Please note that changing the password on the RHN website changes only the local password on the RHN Satellite Server, which may not be used at all if PAM is enabled for that user. In the above example, for instance, the Kerberos password will not be changed.

## 8.10. Enabling Push to Clients

In addition to allowing client systems to regularly poll the Satellite for scheduled actions, you may enable the Satellite to immediately initiate those tasks on Provisioning-entitled systems. This bypasses the typical delay between scheduling an action and the client system checking in with RHN to retrieve it.

**Important**

SSL must be employed between the Satellite and its clients systems for this feature to work. If the SSL certificates are not available, the daemon on the client system fails to connect.

To take advantage of this feature, you must first configure your firewall rules to allow connections on the required port(s), as described in Section 2.4, “Additional Requirements”.

Then you must install the **osa-dispatcher** package, which can be found in the RHN Satellite Server software channel for the Satellite within the central RHN website. Once installed, start the service on the Satellite as root using the command:

```
service osa-dispatcher start
```

Finally, install the **osad** package on all client systems to receive pushed actions. The package can be found within the RHN Tools child channel for the systems on the RHN Satellite Server. Once installed, start the service on the client systems as root using the command:

```
service osad start
```

Like other services, **osa-dispatcher** and **osad** accept **stop**, **restart**, and **status** commands, as well.

Keep in mind, this feature depends on the client system recognizing the fully qualified domain name (FQDN) of the Satellite. This name and not the IP address of the server must be used when configuring the **Red Hat Update Agent**. Refer to the *RHN Client Configuration Guide* for details.

Now when you schedule actions from the Satellite on any of the push-enabled systems, the task will begin immediately rather than wait for the system to check in.

# Sample RHN Satellite Server Configuration File

The **/etc/rhn/rhn.conf** configuration file for the RHN Satellite Server provides a means for you to establish key settings. Be warned, however, that errors inserted into this file may cause Satellite failures. So make configuration changes with caution.

You should be particularly concerned with the following parameters: traceback_mail, default_db, and server.satellite.http_proxy. Review the sample and its comments, beginning with a hash mark (#), for additional details.

```
#/etc/rhn/rhn.conf example for an RHN Satellite
#-----------------------------------------------

# Destination of all tracebacks, such as crash information, etc.
traceback_mail = test@pobox.com, test@redhat.com

# Location of RPMs (Red Hat and custom) served by the RHN Satellite
mount_point = /var/satellite

# Corporate gateway (hostname:PORT):
server.satellite.http_proxy = corporate_gateway.example.com:8080
server.satellite.http_proxy_username =
server.satellite.http_proxy_password =

# Database connection information username/password@SID
default_db = test01/test01@test01


### DON'T TOUCH ANY OF THE FOLLOWING ###
web.satellite = 1

web.session_swap_secret_1 = ea6c79f71cfcf307d567fed583c393b9
web.session_swap_secret_2 = 01dee83a7b7f27157f5335744eb02327
web.session_swap_secret_3 = 4e89e7697ce663149ca9e498cbc08b4f
web.session_swap_secret_4 = a0fed2d77a950fc9a800b450a45e89d2

web.session_secret_1 = 24bc562e04c9b93f5be94f793738e104
web.session_secret_2 = 7667a7c2db311b1ea04271ecc1b82314
web.session_secret_3 = 442e7dc4f06f63eba9a0408d499c6a8d
web.session_secret_4 = 587a0db47856f685d989095629a9bd6f

encrypted_passwords = 1

web.param_cleansers = RHN::Cleansers->cleanse
web.base_acls = RHN::Access

web.default_taskmaster_tasks = RHN::Task::SessionCleanup,
                               RHN::Task::ErrataQueue,
                               RHN::Task::ErrataEngine,
                               RHN::Task::DailySummary,
                               RHN::Task::SummaryPopulation,
                               RHN::Task::RHNProc,
                               RHN::Task::PackageCleanup

web.rhn_gpg_backend_module = RHN::GPG::OpenPGP

web.restrict_mail_domains =
```

# Index

## Symbols

**/etc/nsswitch.conf , Host Not Found/Could Not Determine FQDN**

**/etc/rhn/rhn.conf , General Problems**

## A

**advantages, RHN Satellite Server**

**Apache, Updating the Satellite**

**Apache HTTP, How it Works**

**automating Satellite synchronization, Automating Synchronization**

## B

**backing up the RHN Satellite Server, Backing Up the Satellite**

**block sizes, Database Requirements**

## C

**channel**
- definition, Terms to Understand

**channel content**
- import process, Preparing Channel Content ISOs

**channel content ISOs**
- preparing, Preparing Channel Content ISOs

**channel package**
- default location
  - /var/satellite/ , Base Install

**chkconfig , Additional Requirements**

**cloning satellite, Cloning the Satellite with Embedded DB**

**Configuration Administrator**
- definition, Terms to Understand

**connection errors, Connection Errors**

## D

**database requirements**
- character set, Database Requirements

- Oracle access level, Database Requirements

**database RPMs**
- default location
  - /opt/ , Base Install

**db-control**
- options, DB Control Options

**db-control use, Using RHN DB Control**

**disable services**
- ntsysv
  - chkconfig , Additional Requirements

## E

**embedded database**
- default location
  - /rhnsat/ , Base Install

**enabling push to clients, Enabling Push to Clients**

**entitlement certificate, Additional Requirements, RHN Satellite Server Installation Program**
- uploading, Uploading the RHN Entitlement Certificate

## F

**firewall rules**
- requirements, Additional Requirements

## G

**general problems, General Problems**

**GPG keys, RHN Satellite Server Installation Program**

## H

**host not found error**
- could not determine FQDN, Host Not Found/Could Not Determine FQDN

**how it works,** How it Works

**httpd ,** Additional Requirements

## I

**import**
- channel content
  - process, Preparing Channel Content ISOs

**importing**
- satellite data, Importing and Synchronizing

**importing data**
- placing Errata in repository, Running the Import
- populating the channel, Running the Import
- running the import, Running the Import

**installation**
- base, Base Install
- MySQL, MySQL Installation
- of RHN Satellite Server, RHN Satellite Server Installation Program
- sendmail, Sendmail Configuration

**Installation**
- automated, Automated RHN Satellite Server Installation

**installation task list,** Summary of Steps

## L

**log files,** Log Files
- table, Log Files

## M

**maintenance,** Maintenance

**mysql-server ,** MySQL Installation

## N

**Network Time Protocol,** Additional Requirements

**ntp,** Additional Requirements

**ntsysv ,** Additional Requirements

## O

**operating system**
- supported, Software Requirements

**Oracle 9i R2, How it Works**

**Organization Administrator**
- definition, Terms to Understand

**osa-dispatcher , Enabling Push to Clients**

**osad , Enabling Push to Clients**

## P

**PAM authentication**
- implementation, Implementing PAM Authentication

**port 443, Additional Requirements**

**port 4545, Additional Requirements**

**port 5222, Additional Requirements**

**port 5269, Additional Requirements**

**port 80, Additional Requirements**

## R

**Red Hat Network**
- introduction, Red Hat Network

**Red Hat Update Agent**
- definition, Terms to Understand

**redundant satellite, Establishing Redundant Satellites with Stand-Alone DB**

**requirements, Requirements**
- additional, Additional Requirements
- database, Database Requirements
- DNS, Additional Requirements
- entitlement certificate, Additional Requirements
- firewall rules, Additional Requirements
- FQDN, Additional Requirements
- hardware, Hardware Requirements
- jabberd, Additional Requirements
- ntp, Additional Requirements
- software, Software Requirements
- TCP Ports, Additional Requirements

**RHN**
- components, How it Works

**RHN DB Control**
- backup, Backing up the Database
- options, DB Control Options
- restore, Restoring the Database
- verify, Verifying the Backup

**RHN Entitlement Certificate**
- options, Command Line Entitlement Options

**RHN Entitlement Certificates, Entitlements**
- receiving, Receiving the Certificate

**RHN Satellite Activate , Managing the RHN Certificate with RHN Satellite Activate**

**RHN Satellite Exporter, Exporting with RHN Satellite Exporter**

**RHN Satellite Server entitlement, RHN Satellite Server Installation Program**

**RHN Satellite Synchronization Tool , Importing with RHN Satellite Synchronization Tool**
- options, satellite-sync

**RHN Task Engine, Maintaining the RHN Task Engine, Accessing the String Manager**

**rhn-satellite**
- service, Managing the Satellite Service

**rhn-satellite-activate , Managing the RHN Certificate with RHN Satellite Activate**
- activating, Activating the Satellite
- options, Command Line Entitlement Options

**rhn-satellite-exporter, rhn-satellite-exporter**
- export, Exporting
- options, rhn-satellite-exporter

**rhn.conf**
- sample file, Sample RHN Satellite Server Configuration File

**rhns-satellite-tools , Managing the RHN Certificate with RHN Satellite Activate, Running the Import**

**rogerthat01@{mail domain} , Sendmail Configuration**

## S

**Satellite Installation Program**
- options, Options to the Satellite Installation Program

**Satellite Ports, Additional Requirements**

**satellite redundancy, Establishing Redundant Satellites with Stand-Alone DB**

**satellite-debug , Satellite Debugging by Red Hat**

**satellite-sync , Running the Import, Synchronizing Errata and Packages Directly via RHN**
- --step=channel-families , Running the Import
- --step=channels , Running the Import
- --step=rpms , Running the Import
- cron job, Automating Synchronization

**sendmail , Additional Requirements**

**summary of steps, Summary of Steps**

**synchronizing**
- keeping channel data in sync, Synchronizing
- satellite data, Importing and Synchronizing

## T

**terms to understand, Terms to Understand**

**tool use, Conducting Satellite-Specific Tasks**

**topologies, Example Topologies**
- multiple satellites horizontally tiered, Multiple Satellite Horizontally Tiered Topology
- satellite and proxies vertically tiered, Satellite-Proxy Vertically Tiered Topology
- single satellite, Single Satellite Topology

**traceback, Terms to Understand**
- definition, Terms to Understand

**troubleshooting, Troubleshooting**
- /etc/hosts , General Problems
- Embedded Database, General Problems
- full disk space, General Problems
- SSL_CONNECT errors, Connection Errors
- traceback email address, General Problems

## U

**updating the RHN Satellite Server, Updating the Satellite**